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JOURNAL of the AMERICAN DIETETIC ASSOCIATION

January, 1937

VOLUME XII NUMBER 5

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Published by
THE AMERICAN DIETETIC ASSOCIATION
Business Office: MOUNT ROYAL AND GUILFORD AVENUES, BALTIMORE, MARYLAND
Advertising and Subscription Offices: 185 N. WABASH AVENUE, CHICAGO, ILLINOIS

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MARY SWARTZ ROSE

VOLUME XII · January, 1937 · NUMBER 5

JOURNAL *of the* AMERICAN DIETETIC ASSOCIATION

DIETITIANS AND DIABETICS AND THE NEW OPPORTUNITIES WHICH PROTAMINE INSULIN AFFORDS[1]

ELLIOTT P. JOSLIN, M.D.

I SEE Webster's unabridged dictionary was right after all. You do look young! The other day I tried to find out what a dietitian was and at least how the word was spelled, but when I turned to the dictionary the word dietitian was not in it. I confess it was the dictionary I had in the country and not one here in the city, but, nevertheless, the 1892 Webster's dictionary does not contain the word dietitian, no matter whether you spell it with a *c* or a *t*. Never forego this advantage. Keep your membership youthful. I remember President Lowell saying how fortunate it often was not to have traditions, because then one had an opportunity to create traditions and create them right. So you, with a young profession and a young society, can originate your own traditions in the pure spirit of high endeavor and youthful optimism.

The dietitian has a great interest in diabetes, a disease so dependent upon diet for its successful management. I know of no disease in which she can be more useful. Indeed, some of you are diabetics and whether you are diabetics because you are dietitians or dietitians because you are diabetically minded is an open question. There is more to be said on both sides than you might realize. Through a recent analysis of my clientêle made through the courtesy of the Statistical Department of the Metropolitan Life Insurance Company, it has been disclosed that those of my patients who are dietitians and nurses hold a unique position.

This unique feature which characterized my diabetic patients who were dietitians and nurses is that they show the highest diabetic heredity of any of the various groups. A positive family history of diabetes existed in 34.7 per cent of the 49 nurses and dietitians, whereas the percentage for *all* females was only 26.1 per cent. I wonder if some of you took up your profession, therefore, from observing the importance of

[1] Presented to the American Dietetic Association at the annual meeting, Boston, October 12, 1936.

diet in the care of a relative with diabetes. Of course I will acknowledge that this may not be a factor and that your high diabetic heredity may simply be explained by dietitians and nurses being members of a superior clan—F. F. V's. or Brahmins, so to speak—and consequently more informed regarding the ills of their ancestors. It is true most of you are women, and a study of my cases shows that women have a higher diabetic heredity than men. Perhaps the explanation is that women take more interest in such matters. Please do not attach too much importance to the diabetic heredity of my group of dietitians and nurses, because, of course, the number is small and if it were doubled it is possible the results would come out quite differently. I wish I knew the exact diabetic heredity in such a company of thoughtful people as you represent. Nothing would please me more than to pass a separate slip of paper to each one of the dietitians in the audience and have her record upon it the presence or absence of diabetic heredity, basing the statement on parents and grandparents, uncles and aunts, brothers and sisters, cousins or children. Gladly would I have the blanks printed for distribution and I am sure the Metropolitan Life Insurance Company would analyze the data for you. Names would not be necessary, simply a record of your age.

Forty-nine nurses and dietitians do not constitute a very large proportion of my patients. In fact it seems like a small number compared with my group of 300 doctors. The reason is not far to seek. Diabetes is twice as common above the age of forty, as below the age of forty, and though there must be a great many more dietitians and nurses in the United States than there are doctors, yet the dietitians and nurses are in the younger group in which diabetes is rare and doctors are in the older group in which it is common.

The prevention of diabetes is important and the need for it is manifestly greater if the individual has a diabetic heredity. Indeed, most of us believe that diabetes is always hereditary, although heredity as a contributing factor in the disease is by no means invariably demonstrable. Thus Ida had no diabetic heredity when her diabetes began, but several years later her grandmother developed the disease. The most notable case of this sort which I remember was at the Henry Ford Hospital in Detroit. I was introduced to a patient who was without known diabetic heredity when she developed diabetes, but when I saw her, some years later, 22 relatives had become diabetic.

The prevention of diabetes can be attempted by control of the body weight. It is rare among the thin over the age of thirty and almost

never is found in an individual, after middle life, who has always been thin. Therefore, if there is any diabetic heredity in one's family, excess of weight must be avoided. By no means can one say diabetes will be averted in this manner, but it is safe to conclude that the chances of its appearing in an hereditarily predisposed individual at a given age will be deferred if he is 10 or 20 per cent underweight which, as a matter of fact, is advantageous for those above thirty-five years of age, and promotes longevity. Aside from controlling the weight, an effort must be made to utilize the muscles, because in them a large part of the carbohydrate is burned. Infections should be avoided, because an infection makes a diabetic worse. Although an infection cannot be demonstrated except in the rarest instance as immediately preceding diabetes, one must say its appearance would tend to make a latent diabetes apparent. Therefore always preach to your classes, whether made up of your profession or the laity, that whereas obesity is bad under all circumstances, particularly is it to be avoided in individuals hereditarily predisposed to diabetes.

Blooming health is an almost *sine qua non* for nurses, but a dietitian must not only look healthy, she simply must not be fat. I will make a ten per cent allowance for excess weight for a dietitian, because one is always afraid of a thin cook, but that is the limit. It may interest you to know that the administrative staff of the New England Deaconess Hospital recommended to the trustees that no nurse should be admitted to the training school who was as much as 40 per cent above normal weight, and that any such nurses already in the hospital should lose weight each year.

No dietitian can afford to be other than a model of health, weight and intelligence, because she serves as an example to her patients of what the proper diet can accomplish. Possessing all these qualities, I confess I am not surprised, despite the fact that the profession is young, that it is hard to find a dietitian over the age of forty.

Excess of weight due to excess of food contributes to the development of diabetes in the hereditarily predisposed, but it is *not* an excess of carbohydrate alone which brings this about. It is true we recognize more diabetics in the United States than in any other country in the world, but there are various countries in which the consumption of sugar is greater. A quite opposite idea has recently been expressed, namely, that diabetes is more apt to develop in those individuals who live upon a high fat—low carbohydrate diet. I cannot accede to that. Support for this idea has been drawn from statistics which show a lower incidence in

countries where carbohydrate is taken freely, particularly in tropical countries, and a higher incidence in those countries in which fat in its various forms is a more common article of diet. Such an argument is not well founded. Diabetes in the United States is nearly double the incidence of diabetes in Canada, but I think no one would claim that the diet of Canadians was particularly different from that of citizens of our country. A more likely explanation is that the average age of Canadians is probably considerably less than that of Americans living in the United States. Against this theory of a high incidence of diabetes in those eating considerable fat, contrasted with those living largely on carbohydrates, is the changing incidence of diabetes in various countries. Thus in Italy in 1920 the rate was 4.5 per 100,000, but in 1934 it was 9.5 per 100,000, or an increase of 111 per cent, whereas the increase in the original registration states of the United States for the same period was only 41 per cent. In England the rate for this same period increased 60 per cent in contrast to our increase of only 41 per cent. Gradually the diabetic incidence in Italy, in England and in various other countries is approaching that of this country. Whether it will eventually be the same all over the world, making allowances for longevity, is a question which can only be answered by the lapse of time.

Diabetes most commonly arises between fifty and fifty-five years of age. A small per cent do not develop it until above the age of seventy and I know of no case in which the disease has originated above the age of eighty-five. This constancy in the development of the disease is quite remarkable and holds throughout the world. In other words, if two diabetics marry all their children can be expected to have the disease, but only provided they live long enough. As a matter of fact, only 44 will live to the ages at which the disease is liable to occur, so that the danger of heredity is not quite so bad as it appears at first sight.

The calculation of diets is fascinating, so much so that only too often doctors and dietitians are so entranced with figuring them, that they attach unwarranted importance to the numerical value of the components of the food. Fortunately a gift from a grateful patient of two kinds of apples last week, allows me to clarify this idea far better than in words. The patient thought that one of the apples could be utilized with safety by a diabetic, whereas the other, because of its sugar content, would be harmful. I hold in my hands an apple from each collection, and to show the fallacy of pushing dietary values to extremes, I asked Miss Hunt, in charge of the chemical laboratory of the New England Deaconess Hospital, if she would determine the glucose value of each.

I will report the result, because I think that no dietitian ever again will feel inclined to carry calculation to the decimal place. The apple I hold in my right hand is similar to the one which Miss Hunt examined. It contained 6.3 per cent carbohydrate and the total carbohydrate for the apple was 16 grams or about 4 teaspoons. The apple I hold in my left hand is also similar to another apple she examined, and that apple contained 17 per cent carbohydrate or a percentage nearly three times as great. This apple is lighter, 219 grams, and the total carbohydrate reached 37 grams or 9 teaspoons of sugar. To see a diet calculated in decimals, when the calculations are based on tables and not on actual analyses of the food served, simply stamps the dietitian as ignorant of the first principles of dietetics. One must remember that one deals not with analyses of an individual portion of a special food but in the best tables one is dealing with multiple and average estimations of food.

The diabetic problem in the United States is a vast one. I suspect there are at least 500,000 living diabetic individuals. Of these, perhaps 150,000 can keep their disease under control with diet alone. The remainder require insulin.

Simplicity in teaching the diet which this multitude of 500,000 should follow, is essential. Fortunately there is fairly common agreement among doctors as to the quantities of various foods which a diabetic requires. Thus for carbohydrate, most believe it should be between 100 and 200 grams. Protein requirement should be the same as for an individual of corresponding age, sex and weight, with fat sufficient for caloric needs, always guarding against overnutrition which is as harmful in the treatment of diabetes as it is favorable to the development of diabetes.

A diet with 150 grams of carbohydrate is simplicity itself. A slice of bread weighs approximately 30 grams or an ounce, and contains 18 grams of carbohydrate. A medium sized orange contains 15 grams, so that if one tells a diabetic patient to take three slices of bread and three oranges a day, or their equivalents, he will receive approximately 100 grams of carbohydrate. Half a portion of cereal will contain about 10 grams of carbohydrate, and experience has taught me that there are few diabetic patients who can eat more than 20 grams of carbohydrate in 5 and 10 per cent vegetables, even if they are allowed to eat all they want. In fact, they are apt to take less. Half a pint of milk contains 12 grams, and a quarter of a pint of cream, 4 grams of carbohydrate, and thus we have carbohydrate approximately 150 grams for 24 hours. I believe these values are the essentials for us to teach diabetic patients. Common sense and their body weight should regulate, save in exceptional instances,

the protein and fat. The instant we complicate dietetic teaching with frivolous details and decimals, which we already know are bound to be inaccurate and therefore worthless, not only do we injure our own reputation, but confuse patients, and if they are at all intelligent we lead them to a distrust in our methods.

Protamine insulin constitutes the greatest advance in the treatment of diabetes since the discovery of insulin nearly half a generation ago. It offers great possibilities for the dietitian and enlarges her sphere of usefulness. Protamine insulin is wonderful. It represents the combination of work started in 1868, and its application to diabetes by Hagedorn in Copenhagen two years ago. It opens up entirely new fields for diabetic research. Protamine insulin is insulin precipitated by a protamine which, for this particular purpose, was the sperm of rainbow trout. When this precipitate is adjusted to the pH reaction of the body it is absorbed so slowly that the effect is nearly double that of regular insulin. The addition of zinc insulin exerts an effect for more than 24 hours. This precipitate of zinc was first made known by Scott and Fisher and is analogous to the effect of ferric chloride and tannic acid described by Bischoff and Mitchell.

Protamine insulin acts slowly, in contrast to regular insulin which acts quickly. The carbohydrate in a meal may be offset by a dose of regular insulin given shortly before the meal, but protamine insulin acts so slowly that it is not adequate to bear the heavy and sudden load of carbohydrate and therefore the peak load of a carbohydrate meal must be lessened and distributed throughout a greater part of the day if protamine insulin is to be used advantageously. This means, first of all, that the meals of a diabetic should be far apart and not crowded into a few hours. It is practically impossible to treat a diabetic satisfactorily with protamine insulin if his breakfast is taken at eight o'clock and his supper at four-thirty or five. Therefore the problem for dietitians arises, in the first place, to spread the meals farther apart.

The second opportunity for the dietitian in arranging the food for a patient treated with protamine insulin is the administration of food between meals and this is for two purposes. Thus by giving these small lunches, the peak load of carbohydrate at meal times can be lessened as suggested above, but in addition these lunches will serve to offset the steady action of the protamine insulin between meals which otherwise might, and, indeed, does lead to insulin reactions caused by lowering of the blood sugar. The diabetic, therefore, today requires meals far apart and trifling lunches in the forenoon, afternoon and upon retiring, in order

to take advantage of the protamine insulin and at the same time to be protected against its continued blood sugar lowering effect.

The composition of these lunches is not an indifferent matter in the avoidance of insulin reactions, which, for me and the doctors in my group, are essentially equivalent to a blood sugar too low. When a patient develops an insulin reaction as a result of using regular insulin, symptoms come on quickly and unless quickly overcome are serious. Therefore, one gives pure carbohydrate in easily absorbable form, or even injects it directly under the skin or into a vein to secure immediate effect and raise the lowered blood sugar to normal. On the other hand, a different situation faces us with protamine insulin. As a rule the onset of a reaction is less rapid and there is more warning, but after combating it with 5 or 10 grams carbohydrate it is quite possible that in subsequent hours the symptoms may return. Therefore it is for the dietitian to discover and teach us doctors what form of carbohydrate it is best to administer under such circumstances. Instead of orange juice, ginger ale or glucose given intravenously for regular insulin, we doctors want you to tell us of slowly acting carbohydrates or even proteins which we can give our patients when symptoms of a reaction threaten from protamine insulin.

The third opportunity for the dietitian to be of great assistance to the patient and the doctor in the administration of protamine insulin, is to adjust the carbohydrate among the three meals, according to the practical needs of the individual. Thus in Denmark most of the carbohydrate is given at breakfast, but with us only one-fifth of the carbohydrate is customarily given at breakfast and two-fifths at each of the other meals. Both methods are allowable by combining regular insulin and protamine insulin in separate injections. One may give regular insulin at one time of the day and protamine at another, or even both varieties before breakfast. Often, however, sugar in the urine will show in the morning, afternoon or evening when the patient is taking a perfectly adequate supply of insulin in one form or another. Under some circumstances, before the dose of insulin is changed, the diet of the patient should be altered, not raised or lowered, and by this simple procedure the patient's urine made sugar free. If a dietitian expects to arrange a diet for a diabetic patient satisfactorily, this can only be done if she knows at what time of the day the diet is followed by a loss of sugar in the urine, and this brings me to the fourth opportunity which protamine insulin presents to the dietitian.

A nurse sent home with a diabetic patient obviously tests the urine

of the patient and regulates the diet to obtain the proper results. This is incumbent upon any dietitian. Nurses and dietitians must not work independently. Success can only be obtained by each learning something of the work of the other. Whether a dietitian wants to be a nurse or not, she will fail in her task in the management of a diabetic unless she will test the urine, adjust the diet and in general protect her patient from many of the complications to which diabetics are exposed. It is quite unnecessary for a dietitian to learn all the functions which a nurse can perform and equally needless for a nurse to know the details of the dietary management of a hospital of 1000 beds, but if either is to help a diabetic the boundary lines must be broken down. Turn about is fair play. It is just as necessary for a dietitian as for a nurse to know that exercise will lower the sugar in the blood of a mild diabetic and even of a severe diabetic who is taking insulin, but will raise it in the case of a severe diabetic who is without insulin. In other words, protamine insulin is enlarging and broadening the opportunities for dietitians. I am only too happy to acknowledge from the practical and beneficial help of dietitians in recent years in the care of my diabetics at the New England Deaconess Hospital, and particularly at the Clara Barton Homestead Camp for Girls, that dietitians do fulfil all these requirements.

The standard of treatment of the 500,000 diabetics in this country will be raised, first, if you can teach diabetics the simple diabetic diet, and then teach all those diabetics, who do not keep sugar free and maintain health and strength without it, to take insulin. To you and to me have been given the means to control diabetes and if we do not do this, whenever you or I hear of the death of a diabetic we must ask ourselves the question whether we did all we could to avert that death or are doing all we might to prevent another. It is not a light task. During 1934 in the United States 28,000 individuals died of diabetes.

THE PROOF OF THE PUDDING[1]

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"THE proof of a pudding is in the eating." So said our grandmothers. As a housewife, her aim was to please the palates of those who sat down to her board. Our mothers profited by advances in the knowledge of the physiology of digestion and might have thought, with Hamlet, "now good digestion wait on appetite, and health on both." For it is an indisputable fact that to whet the appetite and to promote cheerful digestion food must be prepared and served in a way that is attractive to the senses. Pudding, coming as it does at the end of the meal, after the sharp pangs of hunger have been appeased, must have special appeal to overcome the handicap of the substantially sated appetite. It puts the cook on the spot, as it were. Presumably any one can learn to prepare porridge but the pudding is worthy of the best efforts of the chef. The pudding makers whose goods are consumed are, I should think, to be rated as the culinary champions of the gastronomic world.

Apparently there is still belief that it requires a sort of sales campaign to put over the pudding. Last week, according to the Associated Press, the National Restaurant Association, in convention assembled, pondered on the effect of attractive waitresses, suitably costumed, on the consumer interest in food. One infers from the story of these deliberations that baked Indian pudding should be served by a dusky maiden, russet clad, in an oak-panelled room; whereas strawberries and clotted cream were best tendered by a blonde in diaphanous green, undulating past daffodil-colored walls, of course in the springtime of the year. The caption to the story reads, "Proof of the pudding in girl who serves it." So much for eating and the technic of appeal to the senses as an adjunct thereto.

With the newer knowledge of nutrition and the art of dietetics, eating is perceived to be an inescapable but relatively unimportant preliminary to the real business of metabolism. What counts is not so much what is loaded into the stomach as what gets through the walls of the gastro-intestinal tunnel into the living tissues of the owner of the stomach, just as a municipal water supply has potential value merely as long as it is in the water mains (where it may even cause damage if too much of

[1]Read before a dinner meeting of the American Dietetic Association, October 15, 1936, Boston.

it accumulates) and becomes useful only after it gets out of the pipes through faucet or fire hydrant.

Nutrition and dietetics are concerned with the fate of food after eating and their test of food value is not gustation but metabolism.

Foods supply the fuel of the body. Characteristic fuels, they generate heat. Heat is high speed motion of molecules, and this rapid molecular motion is a manifestation of energy, for where there is no energy there is no motion. Man can get hot because he is made of molecules, and when he is excited, it is his molecules that are excited. Excited molecules, like excited human beings, rush hither and yon in agitation. Just as the components of a crowd which gathers to gaze at a traffic accident elbow and push each other and get knocked about in the excitement, so also do excited molecules collide and get knocked about. These are all manifestations of energy.

Energy can assume many and varied forms. The comet and the speeding airplane owe their flight through space because energy has been applied with explosive force to give them propulsion. Chemical reactions take place between groups of matter that have been rendered chemically active by energy application. As a result of chemical reactions, sometimes the new state of matter has more energy than it needs, and the surplus is temporarily freed for other uses. None of it is lost; none of it is newly created. The chemical transactions of the living world are carried out on credit, on borrowed energy, and there can be no spending beyond income. Living is apparently an old deal. The instinct to cling to life is universal.

The present source of our mundane energy is the sun; and we in turn radiate outward energy from the earth. Here again the budget has been balanced for as long as history records. These abstractions on universal energetics are fundamental concepts in nutrition. Physical life is a composite of energy transfers and transformations.

Foods supply more than energy; they furnish the materials of structure in molecules of matter which are carriers and receivers of the energy of life. In the process of living there are many detectable chemical changes and many that are not fully understood. So many are known that we have coined a word to embrace them all, "biochemistry."

In biochemistry there are marriages and divorces among the chemical elements of the body, the chemical elements which have been delivered in the form of food. The mating of carbon and oxygen is a case of love at first sight and the two pass out of the lungs together. As a product of this pairing, free energy is released and may contribute to other

chemical unions which consume energy. By such a socialistic sharing of the common resources, protoplasm is synthesized at the price of burning a bit of fuel and not all of the ashes are discarded but some are used again. Through synthesis of protoplasm the stature of the child is increased; bones are laid down and made strong with deposits of chemical salts. The energy of the beating heart and of the muscles for breathing is supplied, else we perish.

In every population and in all peoples there are good citizens and bad actors. In the chemical population of the body are groups which help and mayhap others which hinder the orderly processes of metabolism. Among those which help are the biochemical catalysts, the enzymes and vitamins. Some promote speedy oxidation of food molecules within cells; others make possible digestion, so that food is absorbed before the intestinal bacteria get it; still others assist in the production of special tissues, and without these aids, the work is too slow for our speed of living. It is not known in any great detail how they work, but we do know about some of the conditions under which they will work and we have found out in the case of some of the vitamins what type of disaster befalls when they are absent.

Vitamin D has been the object of study in my laboratory for many years. It is the name given to a substance which promotes the healing of rickets. Rickets is a disease of the young mammal and apparently affects some birds. It is caused by some failure in the metabolism of phosphorus and calcium, and its conspicuous symptom is bone weakness. Rickets was known 270 years before its cure was worked out in 1921. In that year, McCollum proved that the antirachitic property of cod liver oil is due to the presence of a separate vitaminic substance which he named "vitamin D" and described as "a substance associated with certain fats, which possesses the power to initiate the healing of rickets." Up to the time that I left for a vacation this summer, natural vitamin D had not been isolated in pure state. One did not know whether it would be a crystal or an amorphous solid or an oil. Research was well under way at the Massachusetts Institute of Technology to establish this point, carried out by my colleague, Dr. Nicholas A. Milas of the Research Laboratories of Organic Chemistry. Upon my return to the laboratory, tests had just been completed showing that a concentrate from fish oil had been obtained which assayed one and one-half million units per gram; this was the highest potency of vitamin D in a natural product ever known. (Ordinary cod liver oil of good grade has 250 units per gram and the best known commercial grades have about 850 units per

gram.) Within the past week or so, a further purification of this concentrate in the laboratory of Dr. Milas was shown by animal experimentation to possess a potency of 10 million units per gram. What the next concentration will show is a matter of conjecture. In 1936, fifteen years after its conception, natural vitamin D is being born from fish oil. Within the month has come a report from Germany of an oily concentrate having 24 million units per gram, and the end is not yet.

It may be news to many that the true vitamin D has not yet been attained free beyond all doubt of contaminating and associated substances. Four years ago, our European colleagues isolated a crystalline antirachitic (Calciferol), having about 40 million units potency per gram, and thought at the time to be pure vitamin D. Calciferol is a man-made vitamin, and is prepared by exposing ergosterol to ultraviolet light after the method of Steenbock and Hess, with subsequent chemical treatment of the irradiated material to rid it of inert ingredients. There are chemical and clinical types of evidence to indicate that man-made calciferol is not identical with natural vitamin D, although each is antirachitic in some degree. This had led to the opinion in the last two or three years that there may be a multiplicity of antirachitic substances differing each from the other. In a recent conversation with Dr. McCollum, the discoverer of the original vitamin D, we were able to catalogue eight possibly different forms. There may be more.

Included in such a list might be the following items:

1. Natural vitamin D of fish liver oil, and according to Bills, not the same antirachitic in all fish livers.
2. Irradiated ergosterol type—calciferol, viosterol.
3. Irradiated cholesterol—discarded by Windaus and others in 1925, rescued by Koch in 1929, and established firmly by Waddell in 1935.
4. A fatty acid fraction of milk—demonstrated by Kon and Booth in 1934.

That there are other antirachitic factors in diet is established beyond doubt. The relation of phosphorus to calcium is important. There is evidence in my own laboratory that casein, the principal protein of milk, when used as the sole protein in a diet which by all classical criteria should be rachitogenic for rats, protects against the development of rickets even when the imbalance between calcium and phosphorus is as great as 8 to 1, and in spite of the most rigorous method of purification of the casein from all other ingredients, which it has been possible to devise over a period of years.

The work of Supplee indicates that substances associated with vita-

min D in the diet may influence its activity, and the lesser milk protein, lactalbumin, is believed by him to form a simplex with the irradiation type vitamin which combination has more efficiency than plain viosterol.

There are numerous ways of producing synthetically an antirachitic substance. The ultraviolet irradiation of ergosterol led to the pharmaceutical preparation of viosterol, an irradiated product in bland oil. The irradiation of cholesterol certainly produces a different type of antirachitic. Recently a derivative of cholesterol has been irradiated, and from it a crystalline product isolated, having 24 million units potency per gram. In our own laboratory, Milas, Harris and myself have prepared an antirachitic vitamin by radio, as it were, utilizing the electromagnetic force of a short wave radio transmitter to activate ergosterol in a substantial vacuum, and have repeated the process with variations, successfully, over 250 times. Cathode rays have been used for activation, and sunlight in Arizona has been harnessed to do this work.

The treatment of foods by ultraviolet light with the enhancement of their rickets preventing potency has been known since 1925, and among the foods thus treated irradiated milk has established a useful position.

Vitamin D properties are possessed in appreciable quantity by only a few foods. Fish liver oils have the greatest concentration, from 100 to over 200 units per gram is not unusual. A few samples of uncommon fish oils have assayed much higher than this. Egg yolks come next with 20 to 100 units per 60 gram yolk. Milk has an irregular and unreliable content and in our experience furnishes from 7 to 40 units per quart. Cream is the carrier of this vitamin in milk. Irradiated milk has 135 units per quart and metabolized milk, the name given to the milk of the cow which has been fed irradiated yeast, carries 430 units per quart.

The literature on vitamin D is confused by a changing terminology in respect to units, and by conflicting reports of clinical tests, based on bioassays which have not always been precise. The international unit of vitamin D is the vitamin D activity (toward albino rats) of one milligram of a standard solution of irradiated ergosterol prepared under the supervision of the League of Nations Health Organization and distributed to the world. In our own country it is common practice to use U. S. P. reference cod liver oil containing 95 international units per gram. Why 95 and not 100 units in this oil, I have no idea. The healing effect of administering one international unit to a rachitic rat is not measurable; it takes from 2.7 to 3.5 international units per rat to induce a detectable unbroken line of new bone tissue across the end of the rachitic leg bone, which is the degree of healing corresponding to a Steen-

bock rat unit. Obviously, the amount of vitamin necessary to effect this degree of healing will depend upon the severity of the rachitic condition in the rat treated. By strict precautions, it is possible to show a Steenbock unit healing by feeding 2.7 to 3.0 international units, but without strictly standardized procedure the ratio between the two values may vary to an even greater extent. For the last two years in the United States we have used the U. S. P. unit, which is exactly the same as the international unit.

All antirachitics are now described in terms of U. S. P. or its equivalent, the international unit. This implies the conception that all antirachitics are alike. Such, however, is not the case; as many as eight types have been suggested, but each will initiate healing of rachitic rats. The more recent literature suggests that some of the clinical differences thought to exist for children may not be real. A recent report from the U. S. Food and Drug Administration and the U. S. Children's Bureau offers "certain evidence that a unit of vitamin D in irradiated ergosterol prevents rickets as efficiently as one unit in cod liver oil" provided that each substance has its unit value established in the same way on rats. Similar findings are those of Drake, Tisdall and Brown, and in the two sets of clinical tests 700 infants or children were studied. Gerstenberger, in an excellent study, found no significant difference, in human effectiveness, between cow's milk rendered antirachitic by irradiation or by feeding the cows with irradiated yeast, when compared unit for unit on the basis of rat bioassays in the same laboratory. This coincides with an earlier finding of Wyman of the Boston Children's Hospital in collaboration with myself and others. When the bioassays have been on a strictly comparable basis, the results indicate less and less clinical difference between some of the supposedly different kinds of antirachitics.

That the other constituents fed along with vitamin D may influence its effectiveness is quite probable, a view which is supported by recently published work of Supplee on the effect of lactalbumin when fed with this vitamin.

The value of vitamin D milk for infants and growing children is a real one. Unfortified milk is not reliable as a preventative of rickets. Its supplementation with cod liver oil is bothersome to the mother and not always well tolerated by the victim. Vitamin D in milk is convenient and efficacious. What the least protective dosage is, has not been definitely worked out. Pediatricians in general are inclined to believe that all except premature babies or identical twins will probably be insured against rickets if the sole source of vitamin D is in vitamin D milk

of 430 units per quart, when fed in the usual quantity, and that milk of less than half that potency will perhaps protect. Irradiated milk can be produced of higher potency than that which is now standard for that grade of milk, and without the development of disagreeable flavors which early experiments indicated might develop from over irradiation. Such a step would mean scrapping much of the present equipment and installing irradiators of more improved design. If it were shown that this is actually needed, it would doubtless be accomplished in short order.

The benefits to be derived from adequate supplies of this vitamin probably exist in the first twenty years of life, with probably a diminishing requirement toward the end of this period. For the adult, the benefits of additional vitamin D supplies are problematical, except in the case of the expectant or the nursing mother, where the need of her child may be partly met in this indirect manner. Human breast milk, however, seems an unreliable source of antirachitic for the nursing infant unless it be supplemented with cod liver oil or irradiation of the infant's skin by sunlight or other source of ultraviolet. It makes one wonder how we and our ancestors ever grew up.

How can we know if an adult population, properly protected in youth against rickets, with a supply of the antirachitic vitamin maintained throughout adult life, may not retain a more stable physical constitution than that of previous generations? Vitamin D has been known for fifteen years only. Time has been far too short for any controlled test on this point; some evidence suggests—but to me does not seem to prove—a benefit to the adult consumer of vitamin D as a supplement to a diversified diet. It may be so.

The vitamins have come to our attention at a late stage in our development of dietetics, almost as it were in the position of the pudding which closed the meal of our grandparents. The public is rather satiated with food fads and is cool towards what it suspects may be another. The dietitian and the sober nutritionist are faced with the need for making the vitamin pudding attractive enough so that our clients will wish to sample it. Perhaps progress may lie in earnest efforts to strip away the mystery and the cloying sauce of extravagant claims of efficiencies which are only imagined or suspected. Perhaps we can convince ourselves and pass on to others our conviction that vitamins for grown-ups are worth a trial, especially when they can be tried in so painless and simple a manner as in milk. Perhaps the proof of vitamin D, after all, lies in a long time test of milk pudding.

THE EFFECT OF A MIXED UNFORTIFIED DIET ON THE SKELETAL DEVELOPMENT OF RACHITIC RATS[1]

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THERE is no chemical test for vitamin D, therefore biological procedures are necessary. These procedures are based on the results of four separate and distinct investigations, the first of which was reported by Schmorl (1) who demonstrated, after several years of work, that the healing of rickets was instituted by a deposit of calcium salts in the metaphyses of the long bones. This area of deposit is today referred to as the zone of provisional calcification.

The second was reported by Sherman and Pappenheimer (2), who found that young rats became rachitic when fed a diet high in calcium and low in phosphorus. The rickets produced by this diet is histologically and chemically very similar to human rickets, and regarded by some as "identical with that seen in human beings." Later, several other rickets-producing diets were devised. The Steenbock-Black (3) rachitogenic diet No. 2965 has been adopted as the standard rickets-producing diet.[2] However, all rachitogenic diets are based on the principle of a high-calcium, low-phosphorus content, as originally worked out by Sherman and Pappenheimer.

The third finding, by McCollum, Simmonds, Becker and Shipley (4), was a report of the discovery of the existence of a substance in cod liver oil that "promoted the deposit of calcium phosphate in the zones of provisional or primary calcification of the bones of rats which had been made rachitic by feeding them a diet high in calcium and low in phosphorus." This substance is now known as vitamin D, and has been found in varying amounts in many substances.

The fourth fundamental report, by McCollum, Simmonds, Shipley and Park (5), described a test by means of which a deposit of calcium phosphate in the zones of provisional calcification of the bones of rats could be quite readily detected. This is accomplished by the immersion of a longitudinal section of the femur or the tibia of a rat in a solution of

[1] Research supported in part by a grant from the Horace H. and Mary A. Rackham Fund. Received for publication, September 15, 1936. The authors acknowledge with appreciation the counsel of Dr. L. H. Newburgh, and the assistance of Drs. Carl V. Weller and John C. Bugher.

[2] The Steenbock-Black rachitogenic diet No. 2965 consists of 76% whole yellow corn, 20% gluten flour, 3% calcium chloride, and 1% sodium chloride.

silver nitrate, followed by exposure to a strong light (or sunshine). The appearance of a *dark line* in the zone of provisional calcification a few minutes after the specimen is exposed to the light, is due to the physical fact that silver nitrate, in contact with the calcium phosphate of the zone of provisional calcification, forms silver phosphate. This, like many silver salts, darkens quickly when exposed to light, and indicates the presence of ossification. McCollum and his co-workers called this method the "line test."

The biological procedures devised to test substances for vitamin D make use of these four investigations in the following manner:

1. Young rats are made rachitic on a high-calcium, low-phosphorus diet, while kept in a dark room.
2. The substance to be tested for vitamin D is then added to the high-calcium, low-phosphorus diet. Since McCollum and his co-workers made their original report, the rule has been adopted that the amount of test material added shall not exceed 10 per cent of the amount of the high-calcium, low-phosphorus diet. More than 10 per cent is considered likely to increase the mineral content of the diet, and by so doing increases the calcifying properties.
3. At the end of a stated period on this modified dietary, the animals are killed and the zones of provisional calcification are examined for evidence of healing by means of tests for the deposition of calcium phosphate in the zones of provisional calcification.
4. The presence of deposits of calcium phosphate is quickly detected by subjecting the bones to the "line test." If this procedure produces no dark line, the substance tested is said to be devoid of vitamin D. If a faint or indistinct line is produced, the substance is reported as having a one plus (+) vitamin D value. If a distinct line is produced, the material is reported as having a two plus (++) value, while a dense line indicates a three plus (+++) and a heavy, dense line a four plus (++++) vitamin D potency.

Since the "line test" was reported, other tests have been developed. Without sacrificing the animals, roentgenograms can be quickly produced which show the presence or absence of calcification in bones as small as those of rats. More precise information may be obtained by histological examination. A final decision can be had by means of chemical analysis, since it permits one to express information quantitatively. Histological examinations and chemical analyses, while yielding precise information, are unfortunately time consuming and technical; hence, the "line test," because of the rapidity and ease of its execution, is very generally used. Nevertheless, it is not a true quantitative test.

By means of the biologic procedures above reported, the vitamin D values of all common food substances except egg yolk are reported either

as entirely devoid of vitamin D, or as inferior in vitamin D value to certain fish liver oils and irradiated materials. As a result, it is taught almost universally that common foods are inadequate sources of vitamin D, and that diets not fortified by certain fish liver oils or irradiated materials are inadequate for normal bone formation and the prevention of rickets.

However, many investigators are not convinced that the ossifying values of common foods are as hopelessly low as reported. Sherman has said (6): "The anti-rachitic values of cod liver oil, of irradiated ergosterol and of ultraviolet irradiation of the body, are so great that they have absorbed attention to perhaps a greater extent than is desirable. . . . the anti-rachitic value of some common foods should not be ignored." Sherman observes further that the failure of the evidence of vitamin D in some foods "is probably due in large part to the use in many experiments of so drastic a rickets-producing diet that symptoms of rickets developed in the experimental animals notwithstanding the presence of amounts of vitamin D (in the food fed for test) which would have been measurable under more nearly normal conditions."

In 1925 E. Mellanby (7), working with puppies, reported "calcifying properties" in both green vegetables and butter fat. This finding was supported by May Mellanby (8). Chick and Roscoe (9) found summer-grown spinach to be productive of slight calcification in rats. The latter was supported by M. H. Roscoe (10) who observed "slight but definite influence upon calcification by adding fresh spinach to the rachitogenic diets fed rats and rabbits." Hess (11) reported therapeutic value in egg yolk. Kohman, Sandborn, Eddy and Gruin (12) reported that the addition of cod liver oil to a diet of canned peas, canned spinach, canned carrots and roast beef did not markedly affect the bones of rats, even when a sufficient amount of calcium lactate was added to the diet to give it a calcium-phosphorus ratio similar to that of Steenbock-Black's rachitogenic diet No. 2965.

Our studies of the mineral metabolism of the rat have caused us to doubt the reported deficiency of common foods, as well as to question the belief that all unfortified diets are inadequate for the prevention of rickets. We were not convinced that the high vitamin D values of fish liver oils and irradiated substances represent the minimal requirement for the production of normal bone and the prevention of rickets. Furthermore, we questioned whether the failure of a single food substance to promote the healing of rickets in rats, when added in an amount equal to only 10 per cent of the rachitogenic diet, proved such food substance

deficient in vitamin D, or whether it only proved that the *amount* of the food substance was inadequate to overcome the deficiencies of the rachitogenic diet to which it was added.

To limit the amount of a food substance added to a test diet, in order to control the amount of the minerals, is a justifiable procedure in an assay of the vitamin D content of a food, but is not a true measure of the calcifying properties of that food because the calcifying properties of the minerals contained therein are not taken into consideration.

Ether extracts of foods do not represent the total calcifying properties, as such extracts contain only the fat-soluble ingredients, and no minerals.

The calcifying influences of minerals in bone formation have been repeatedly demonstrated.

The above considerations gave rise to the question whether there is, in the common unfortified diet, a sufficient amount of calcifying factors to prevent rickets and produce normal bone, even though the *individual* food substances of which the diet is composed are low in vitamin D value when compared with fish liver oils and irradiated ergosterol, by means of the "line test." In order to derive an answer to this question, the following experimental procedures were employed:

EXPERIMENT

One hundred and twenty normal albino rats, 27 to 33 days old, produced in our inbred colony, were placed in a dark room and fed Steenbock-Black's rachitogenic diet No. 2965 and distilled water. At the end of 33 days on this diet, roentgenograms of 116 animals demonstrated a severe stage of rickets. Four had died of undetermined causes.

Upon return to the dark room, each rat was weighed and returned to its numbered cage. The rats were then divided into four groups for the second phase of the test feeding. There were 29 rats in each group.

Group I was continued as control on the rachitogenic diet.

Group II was fed the rachitogenic diet, fortified by the addition of 0.03 per cent by weight of a standard preparation of Viosterol 250 D.[3] This afforded a diet with a vitamin D value adequate for the healing of rickets in rats, as shown first by McCollum, Simmonds, Shipley and Park (5).

Group III was fed the rachitogenic diet modified by the addition of sodium phosphate (Na_2HPO_4)in amount sufficient to afford 0.04 per cent value in secondary phosphorus. This phosphorus value is sufficient

[3] A standard Viosterol (irradiated ergosterol) 250 D has a vitamin D value 100 times that of a standard cod liver oil.

to prevent rickets in rats, as shown by Sherman and Pappenheimer (2), and as effective as irradiated ergosterol in the cure of rickets in rats, as shown by us (13) in 1935.

Group IV was taken off the rachitogenic diet entirely, and fed table leavings. This material was composed of all food residue left on the dishes in the cafeteria[4] of the University Hospital as they were returned to the dish-washing room after each noon meal. Each rat in this group was daily given a generous helping of these table leavings and permitted to make its own selection of quantity and quality. The residue was removed from the cages each morning. Each animal thus received generous daily portions of common foods, but no fish liver oils or irradiated substances. In addition, each rat was given 10 to 15 cc. of non-irradiated whole cow's milk from the commercial dairy which supplied the cafeteria at the University Hospital.

The feeding just described was continued for 33 days, during which time 6 rats in Group I, 2 in Group II, and 2 in Group III died of undetermined causes. On the 33rd day, half of the remaining animals of each group were weighed and x-rayed, then chloroformed, autopsied, and both femurs of each rat removed, one femur being used for bone ash studies and the other for histologic studies.

Since we also wished to determine whether the animals would present evidence of complete repair and resumption of normal histologic and roentgenographic bone structure at maturity, the half of the animals which were not chloroformed on the 33rd day were continued on the above described diets 57 days longer, or a total of 90 days. This permitted the rats to attain *full maturity*, as they were all between 117 and 123 days of age. During this period all of the animals of Group I died with roentgenologic evidences of extremely severe rickets, chest collapse and loss of weight, and many developed complete paralysis of the hind legs. In addition, one animal of Group II and 2 of Group III died of causes unknown.

On the 90th day all the remaining animals were weighed, x-rayed, then chloroformed, autopsied and both femurs of each rat were removed, one femur being used for bone ash studies and the other for histologic studies. The following data were obtained:

[4] From 475 to 500 persons are served in this cafeteria each noon. Beef, pork, mutton, veal, liver, fish, chicken, eggs, cheese, cooked and raw vegetables, as well as pie, cake, puddings, custards, salads and bread and butter, are included in foods available.

"The food served at the University Hospital is not fortified with any vitamins, either by irradiation or the addition of concentrates." (*Signed*) Mable MacLachlan, director, Department of Dietetics and Housekeeping.

PHYSICAL CONDITION

All the animals in Group I and a few in Groups II and III died before reaching maturity, but all the animals in Group IV survived.

The growth and general physical condition of each group is shown by the average changes in weights reported in table 1.

We have no explanation for the remarkable gain in weight of Group IV other than that this was due to the generous, mixed unfortified diet.

TABLE 1

Average change in weight, in grams, per rat

GROUP	33 DAYS	90 DAYS
I. Diet 2965	Lost 2	All dead
II. Diet 2965 + Viosterol	Gained 33	Gained 123
III. Diet 2965 + $Na_2H\ PO_4$	Gained 50	Gained 146
IV. Common food diet	Gained 88	Gained 267

TABLE 2

Per cent of ash of moisture and fat-free bones

GROUP	33 DAYS	90 DAYS
I. Diet 2965	29.7	All dead
II. Diet 2965 + Viosterol	49.9	58.2
III. Diet 2965 + $Na_2H\ PO_4$	53.5	64.2
IV. Common food diet	55.3	64.8

CHEMICAL FINDINGS

One femur from each animal in each group was cleaned of all loose connective tissue and attached muscle, dried at 100°C. for one week, extracted in a Soxhlet apparatus with alcohol for ten hours, and with ether for 10 hours, and again dried. After weighing, each bone was ashed at a dull red heat in a muffle-furnace, and the percentage of total ash on the moisture-free, fat-free weight determined (table 2).

A bone ash of 45 per cent is regarded as the lower limit in healed rickets. On this basis, the animals on the test diets presented chemical evidence of healing. The bone ash, at both the 33 and the 90-day periods, in those animals on adequate phosphorus and on the mixed unfortified diet is notably greater than in those on the rachitogenic diet modified by the correction of the vitamin deficiency. It is noteworthy, also, that Group IV, although growing faster and gaining weight much more rapidly than Groups II and III, yielded a bone ash greater than did Groups II and III.

ROENTGENOLOGIC FINDINGS

All animals at the end of the rachitogenic feeding period demonstrated marked stigmata of rickets, as shown in the several accompanying illustrations.

The progressive rachitic damage in the control groups (Plate I) has been noted above.

The evidence of correction of much of the roentgenologic stigmata at the end of the 33-day test feeding with Viosterol (Plate II) or sodium phosphate (Plate III) added to the rachitogenic diet, corroborated our previous report. The substitution of the generous mixed unfortified diet for the rachitogenic one, produced a larger animal with more soft tissue as well as a larger skeleton and virtually no residuum of the rachitic stigmata (Plate IV). Even the wrists showed no residuum, although the animals on the rachitogenic diet modified by the addition of irradiated ergosterol or secondary phosphorus still retained some changes in the distal radial and ulnar epiphyses. On the whole, the appearance of the skeleton is definitely superior in the rats fed the common foods.

At the end of the 90-day period, the skeletal development in Groups II (Viosterol, Plate V) and III (Na_2HPO_4, Plate VI) was roentgenographically good. That of Group IV (mixed unfortified diet, Plate VII) was proportionately greater as the weights would suggest. Close inspection of the epiphyseal areas, especially at the knees and wrists, revealed a greater degree of residual distortion of architecture in the Viosterol group than in the other two. The roentgenologic evidence indicated a better repair of the previous rachitic damage in Groups III and IV than in Group II, with a slightly heavier cortex in the shafts of the bones.

HISTOLOGIC FINDINGS

Microscopic preparations of several femora from each group were made for us by the Department of Pathology, with the report that the animals killed on the 33rd day showed poor development and alignment in Group I, while those of Groups II and III showed normal development and good cell alignment. Group IV (mixed unfortified diet) revealed some persistence of the irregularity in the epiphyseal disc, but with a fairly normal realignment of the cartilage columns, resumption of a normal depth of the epiphyseal disc and the component zones of the metaphyseo-epiphyseal junction.

At the end of the 90-day period, the Viosterol group (Plate V) presented a narrow zone of osteogenesis with some interruption by regions of mature

bone. The zone of osteogenesis in Group III (Na_2HPO_4) was wider than that of the Viosterol group but with greater regularity in architecture. The rats fed on table leavings (Plate VII) showed a zone of osteogenesis in the remaining cartilage slightly less in depth than in that of the secondary phosphorus group, but greater than the Viosterol group. The appearance was that of a normal average progression in osteogenesis of the epiphysis, with normal trabeculae in the proximal portion of the shaft.

DISCUSSION

The substitution of a mixed unfortified diet of common foods for the rachitogenic diet, produced evidence of better repair of the rachitic damage and a more normal skeletal development when contrasted with the results from Steenbock-Black's rachitogenic diet No. 2965 modified by the addition of a known source of vitamin D (0.03 per cent by weight of Viosterol 250 D).

Which individual foodstuffs and what amounts were selected by the animals of Group IV was impossible to determine. It was observed, however, that some animals drank milk freely, while others drank little or none. Yet none of these rachitic rats failed to recover completely when permitted to select their own diet from a generous amount of unfortified common foods.

The qualitative evidence in the form of the roentgenographic appearance and the histologic structure is confirmed by the quantitative chemical analyses. On a mixed diet of common foods and in a dark room, the increase in bone ash from below 30 per cent to 55.3 per cent in 33 days, and to 64.8 per cent in 90 days, is definitely an improvement over the rise to 49.9 per cent in 33 days and to 58.2 per cent in 90 days on an adequate vitamin D ration.

Further, the effect of correcting only the mineral deficiency of the rachitogenic diet without addition of vitamin D, ultraviolet or sunlight, induced quantitative changes closely comparable to those of the mixed unfortified diet of common foods, as shown by the increase in bone ash to 53.5 per cent in 33 days and to 64.2 per cent in 90 days, in Group III. The roentgenologic and histologic evidence also surpasses in character of improvement that of the groups on the rachitogenic diet plus a specific source of vitamin D.

We have referred to the belief in the field of nutrition that diets of the common foods, unless supplemented with additional specific sources of vitamin D, are not adequate for the production of normal bone. By

the same token, such diets are considered insufficient for the prevention of rickets. Though the vitamin D values of common foods are universally reported low in comparison with those of fish liver oils and irradiated substances, yet the vitamin D value of a food is not an index of the total calcifying and bone-forming properties of that food, because the important calcifying properties of the minerals of that food are not considered. If a vitamin D deficiency existed in the common foods fed in this experiment, the minerals of these foods probably compensated for that deficiency.

However, in this study we were not concerned with the question of *how* the healing by the unfortified foods was brought about: whether it was due to the action of the vitamin D alone or to the mineral content, or to the combined action of the vitamin D and the mineral contents of the foods. Neither were we concerned about the therapeutic use of the different preparations of vitamin D in the treatment of rickets in children. We were concerned only with the truth of the "teaching" that common foods are practically devoid of calcifying properties and that no diet, unless supplemented with some vitamin D adjuvant, is adequate for the production of normal bone and the prevention of rickets.

The results of this experiment bring us to the deduction that the above "teaching" is not tenable, for we find that a diet of common foods, without the addition of specific sources of vitamin D, and without sunlight or artificially produced ultraviolet radiation, not only induced repair of severe rachitic damage but also developed a skeletal formation superior to that in the animals treated by a correction of the vitamin deficiency alone.

CONCLUSION

Albino rats, made severely rachitic on Steenbock-Black's rachitogenic diet No. 2965, were cured of their rickets and developed into large normal animals when permitted to select their own diets from generous helpings of unfortified common foods.

Chemical analyses, roentgenological and histological studies show that the skeletal repair and subsequent development produced by a mixed unfortified diet of common foods are better than that accomplished by the correction of the phosphorus deficiency of the rachitogenic diet without vitamin D. The skeletal repair and subsequent development produced by common foods are definitely superior to that afforded by the correction of the vitamin deficiency alone.

The teaching that common foods without accessory sources of vitamin D are deficient in calcifying factors, is refuted.

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EXPLANATION OF PLATES

PLATE I

RAT NO. 3532. CONTROL (GROUP I)

FIG. 1. Thirty-three days on Steenbock-Black rachitogenic diet No. 2965. Gross rachitic changes of shoulders, wrists, knees and ankles.

FIG. 2. Sixty-six days on the rachitogenic diet. Progression of the rachitic changes with multiple fractures of fibulae and tibiae, collapse of the thoracic cage, loss of weight.

FIG. 3. Photomicrograph of distal epiphysis of femur (66 days on No. 2965). Gross irregularity of epiphyseal cartilage (distortion of severe rachitic bone). Increased depth of cartilaginous zone with osteoid trabeculae. Minimal attempt at ossification.

PLATE II

RAT NO. 3529. RACHITOGENIC DIET PLUS VIOSTEROL (GROUP II)

FIG. 4. After 33 days on Steenbock-Black rachitogenic diet No. 2965. Gross rachitic changes at shoulders, wrists, hips, knees and ankles.

FIG. 5. After a subsequent 33 days on the rachitogenic diet modified by 0.03% Viosterol 250 D (by weight). Repair of a considerable amount of the rachitic stigmata. Proximal portions of tibiae still bulbous with poor bone density, persistent deformity of the distal ends of radii and ulnae, with poor ossification. Multiple rib fractures healing.

FIG. 6. Photomicrograph (femur, distal epiphysis) at end of 33 days on the modified diet. Irregularity in disposition of cartilage cells due to incomplete repair. Narrow zone of osteogenesis, some residual distortion, osteoid trabeculae.

PLATE III

RAT NO. 3519. RACHITOGENIC DIET PLUS $Na_2H\ PO_4$ (GROUP III)

FIG. 7. After 33 days on Steenbock-Black rachitogenic diet No. 2965. Gross rachitic changes at wrists, shoulders, hips and knees. Some in tail segments.

FIG. 8. After a subsequent 33 days on the rachitogenic diet modified by addition of $Na_2H\ PO_4$ in amount to afford 0.04% secondary phosphorus. Repair of majority of previous rachitic damage. Residual bulbous distal epiphyses of radii and ulnae. Some incomplete ossification of proximal ends of tibiae. Fairly good cortical bone throughout, appearing more dense than in Rat No. 3529.

FIG. 9. Photomicrograph (femur, distal epiphysis) at end of the 33 days on the modified diet. Irregularity in disposition of cartilage cells due to incomplete repair, somewhat wider zone of osteogenesis than in Figure 6. Trabeculae are broader and less numerous than in Rat No. 3529.

PLATE IV

RAT NO. 3507. MIXED UNFORTIFIED (TABLE SCRAPS) DIET (GROUP IV)

FIG. 10. After 33 days on Steenbock-Black rachitogenic diet No. 2965. Gross rachitic changes as in Figures 1, 4 and 7. Fracture of left tibia, incomplete.

FIG. 11. After a subsequent 33 days on a mixed unfortified (table scraps) diet. Marked increase in size, as compared with Figures 5 and 8. Increased soft tissue. Apparent complete repair of previous structural rachitic stigmata. A normal rat skeleton roentgenographically.

FIG. 12. Photomicrograph (femur, distal epiphysis). More normal alignment of cartilage cells, large cells in columns near zone of osteogenesis. Narrow zone of osteogenesis. Some distortion residual in mid disc. Osseous trabeculae. Definitely improved structure over that seen in Figures 6 and 9.

PLATE V

RAT NO. 3441. RACHITOGENIC DIET PLUS VIOSTEROL (GROUP II)

FIG. 13. After 33 days on Steenbock rachitogenic diet No. 2965. Gross rachitic changes at shoulders, wrists, hips, knees and ankles. Fracture of left fibula.

FIG. 14. After a subsequent 90 days on the rachitogenic diet modified by 0.03% Viosterol 250 D (by weight). Apparent complete repair of previous rachitic stigmata. The scoliosis is largely postural.

FIG. 15. Photomicrograph (femur, distal epiphysis). At end of 90 days on modified diet. Narrow zone of osteogenesis, with some distortion of remaining cartilage. Interruption of the disc by local area of completed ossification.

PLATE VI

RAT NO. 3422. RACHITOGENIC DIET PLUS $Na_2H\ PO_4$ (GROUP III)

FIG. 16. After 33 days on Steenbock rachitogenic diet No. 2965. Gross rachitic changes as noted in Figure 13.

FIG. 17. After a subsequent 90 days on the rachitogenic diet modified by the addition of $Na_2H\ PO_4$ in amount to afford 0.04% of secondary phosphorus. Complete repair of previous rachitic stigmata. Compare greater size of skeleton and heavier soft tissue with the rat from the Viosterol group at same period (Fig. 14). Normal density of cortical bone.

FIG. 18. Photomicrograph (femur, distal epiphysis). At end of the 90 days on the modified diet. Remaining cartilage cells aligned in columns with minimal distortion. Zone of ossification moderate in depth, longitudinal distribution of the few trabeculae.

PLATE VII

RAT NO. 3431. MIXED UNFORTIFIED (TABLE SCRAPS) DIET (GROUP IV)

FIG. 19. After 33 days on Steenbock rachitogenic diet No. 2965. Gross rachitic changes, as in Figures 13 and 16.

FIG. 20. After a subsequent 90 days on a mixed unfortified (table scraps) diet. Normal, well developed skeleton and soft tissue. Note relative size as compared with Figures 14 and 17. (The scoliosis was produced posturally to include more of the animal on the same amount of film surface for comparison.)

FIG. 21. Photomicrograph (femur, distal epiphysis). At the end of the 90 days of mixed unfortified diet. Normal alignment of remaining cartilage cells. Normal osteogenesis.

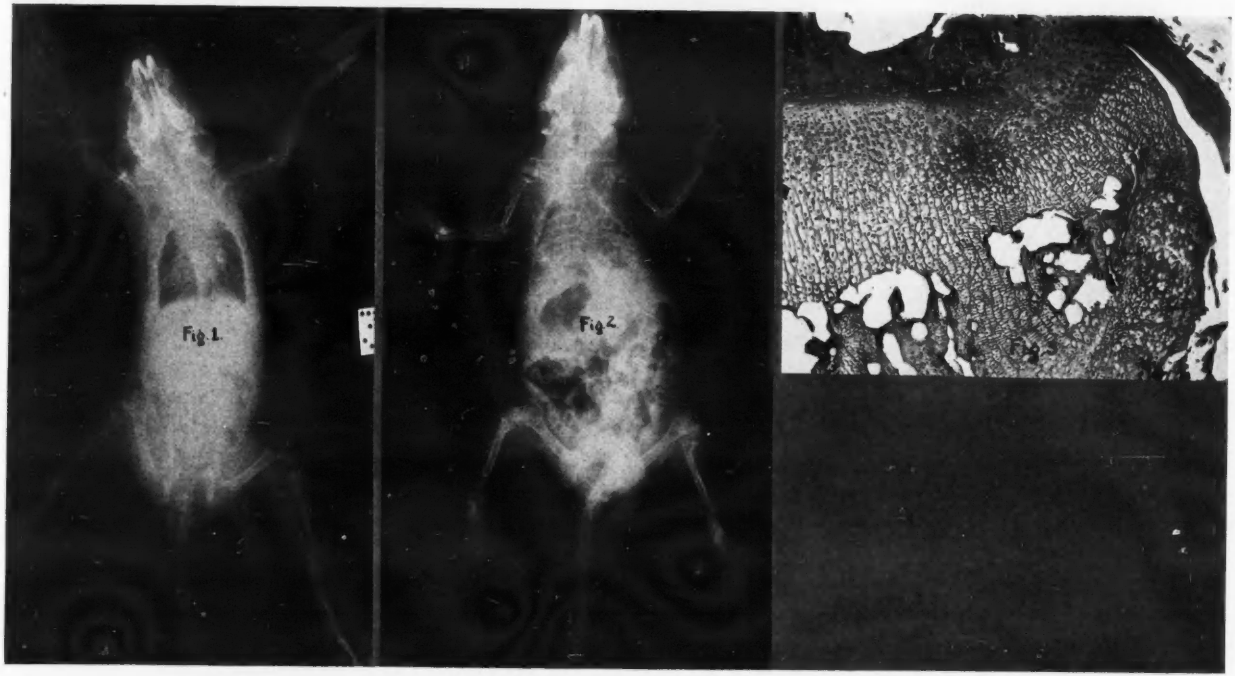


PLATE I

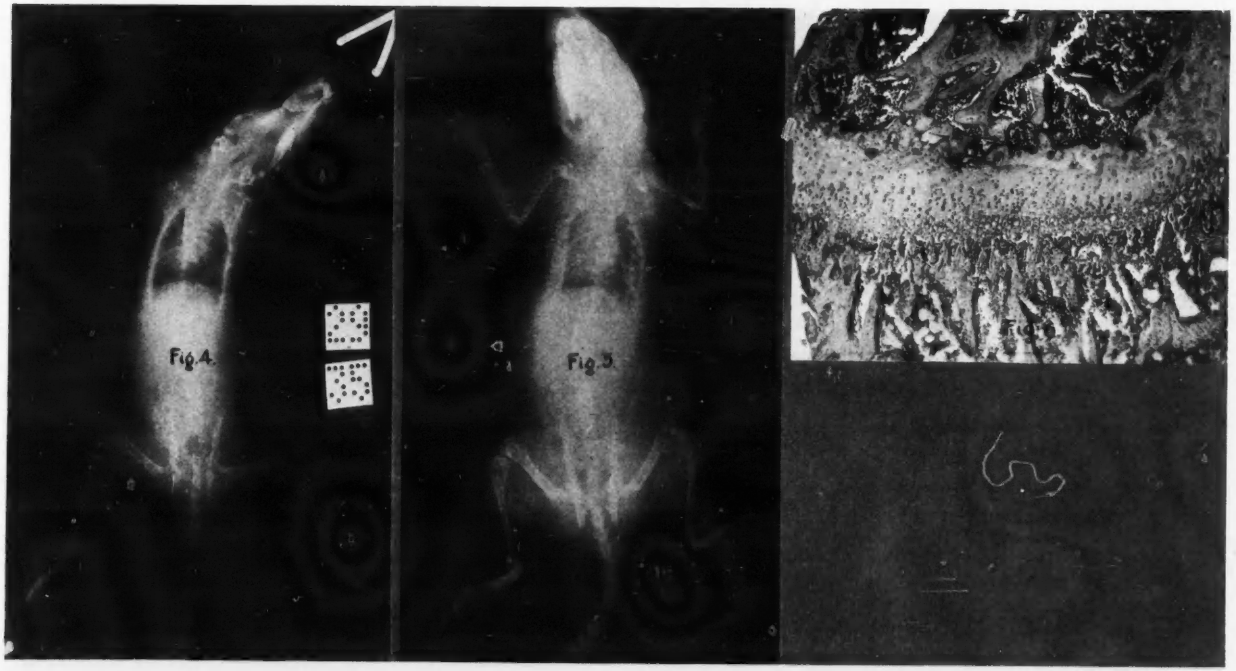


PLATE II

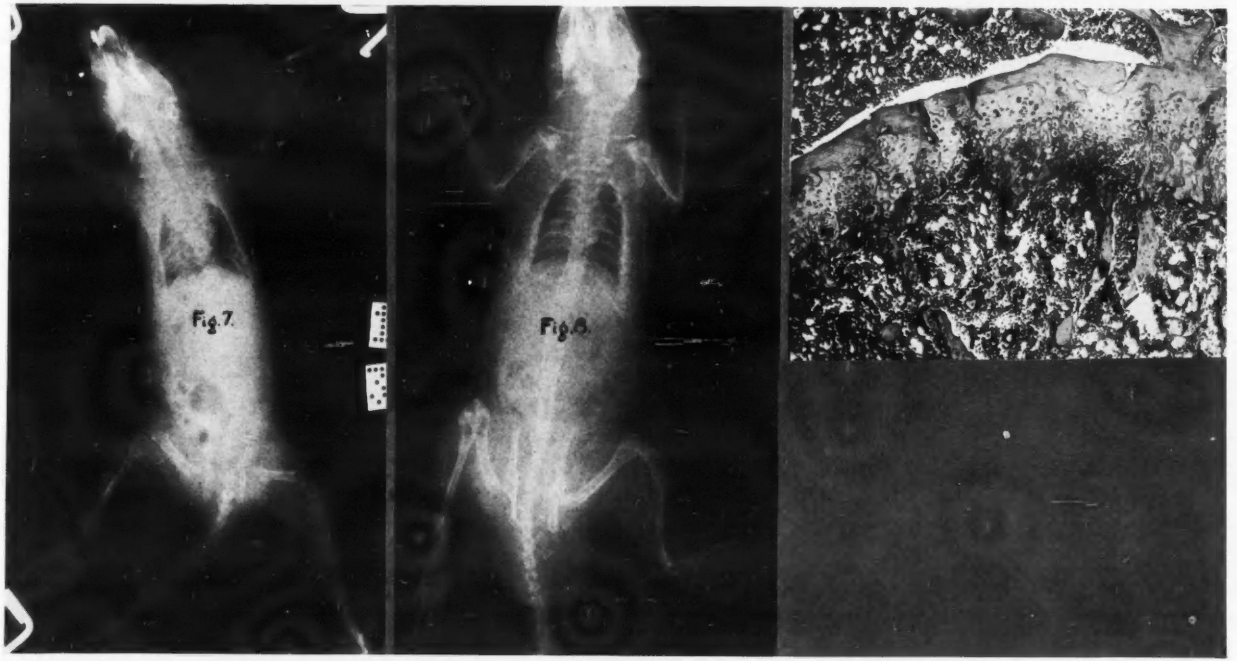
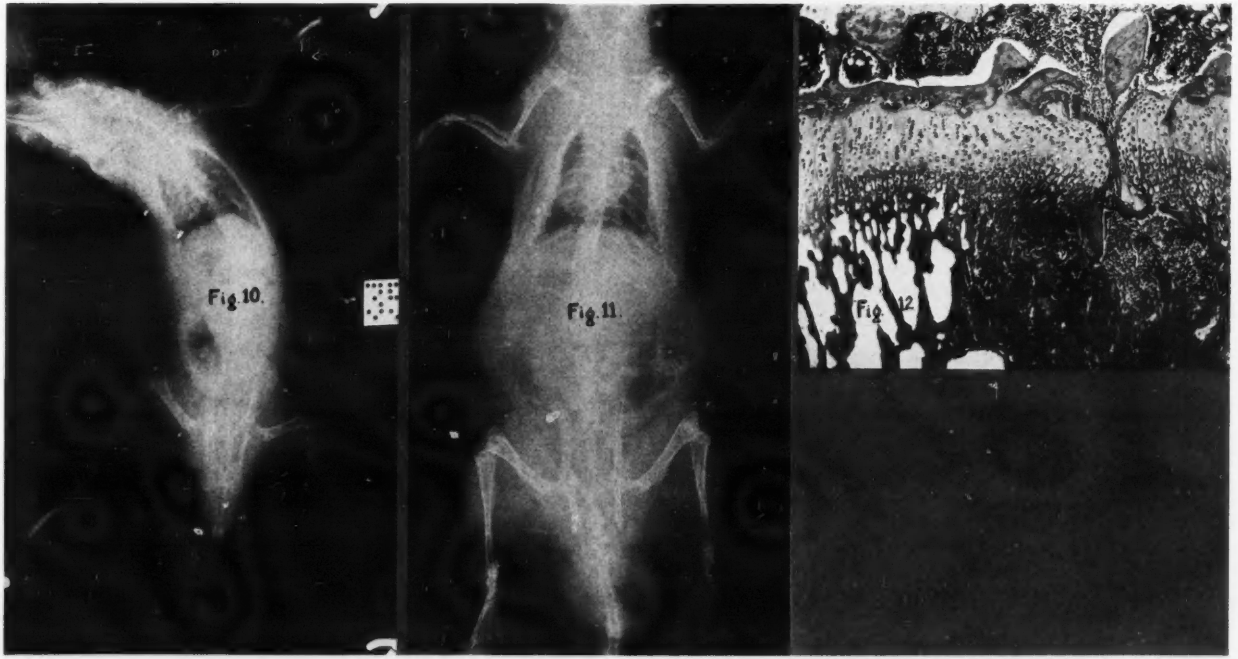


PLATE III



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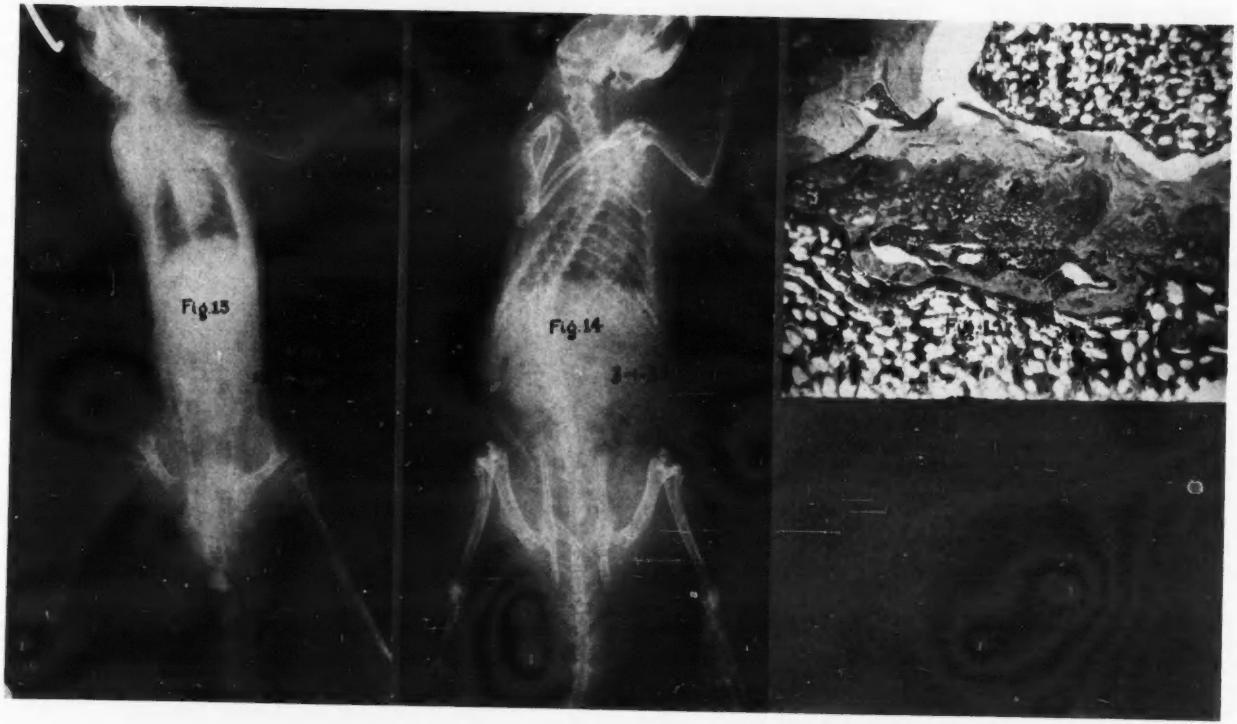

PLATE V

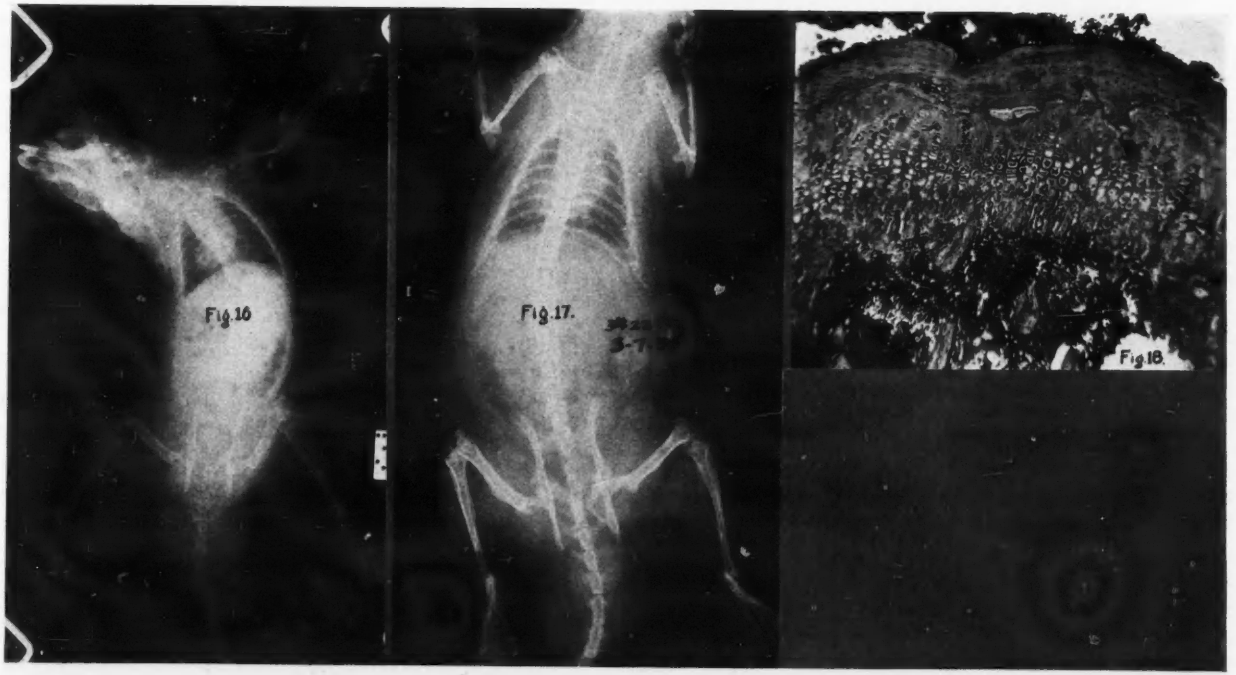

PLATE VI

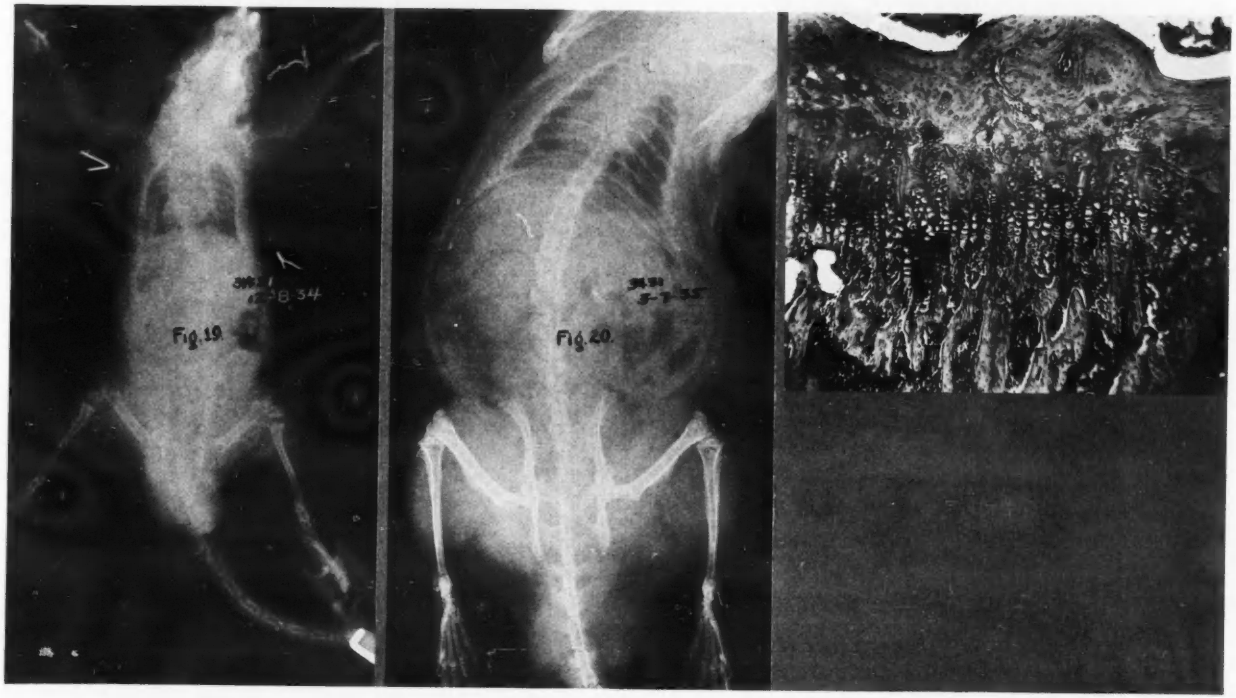

PLATE VII

HEALTH EDUCATION AS A WORLD MOVEMENT[1]

C. E. TURNER, Dr.P.H.

Massachusetts Institute of Technology, Cambridge, Mass.

THE nutrition and dietetic movement has become one of the greatest existing forces for the promotion of health and the prevention of disease. As one looks back over the proud record of accomplishment of your profession, and looks forward to your ever-broadening future of service and professional expansion, it seems fitting here in Boston to pay tribute to that great pioneer in the nutrition movement, Professor Ellen H. Richards. The Massachusetts Institute of Technology is proud to have been affiliated with your profession through the pioneer work of Mrs. Richards, and the splendid contributions of the people who were trained under her leadership.

There is no field of knowledge in which the health education of the public is more important than in that of nutrition. It is for this reason that you as nutritionists are interested in the general problem of health education. From a visit to some twenty-five countries last year it appears that there is no country in the world which is not extending its activities in the field of health education. There is a definite reason for this. It is the next logical step in the evolution of health promotion.

Let me try to present this evolution by an allegory. There is an ancient highway running around the world. Along it men travel carrying their burdens. From time immemorial travelers have cut and bruised their feet on the stones which lie almost hidden in the dust. At first men ascribed the resultant swelling and pain to evil spirits or demons, and sought to improve their condition by imploring the gods or by offering sacrifices to persuade these demons to depart. Later, man learned that health could often be restored by the use of certain drugs or the surgeon's knife, and that it was particularly helpful if treatments were given early. Still later, man discovered that living organisms made their way into the cut and poisoned the body, and an antitoxin was

[1]Presented before the American Dietetic Association, Boston, Mass., October 13, 1936. Contribution No. 83 from the Department of Biology and Public Health, Massachusetts Institute of Technology, Cambridge, Mass., October, 1936.

produced. These were stages in the development of preventive treatment.

In this allegory we have been talking not of tetanus and wounds, but of the highway of custom and tradition in which we find the sharp rocks of unsound racial habits. It is time that we use the tools of education to dislodge and throw away those stones which are dangerous, and make the road of custom safe and conducive to the health and progress of man.

This is being done, but different parts of the world are in different stages of development. There are still many millions of people who are without the service of scientific medicine and who believe in the demonic theory of disease. Their need is for an understanding of some of the simple facts and cause-and-effect relationships in the diseases with which they are confronted. It seems strange to us until we have visited remote parts of the world that there are still groups of people who think of water simply as water, who do not know the difference between water that is wholesome and that which is polluted, who do not distinguish between clean dirt and dirty or infectious dirt. Increasingly, the health programs which are being developed in these countries are including, along with hospital care and the services which do things to people and for them, health education, which is the attempt to do things with people.

Education strengthens a nation. It is being found better to help people to walk along the road of progress than to handcuff them and compel them to ride in a vehicle which they do not understand, to try to transport them against their will. May we illustrate this point?

When in Egypt last year, an American public health engineer told me that one of the Egyptian officials had tried to persuade a private agency to build a model village and move the people from an old, dirty village into the new and sanitary one. The public health engineer said, as you probably would, "Would it not be better to change the people rather than change the houses in which they are living?"

In Java by accident this sort of thing had actually happened. The Dutch Colonial Government was building a reservoir at a place where a native village stood, and it had to be removed. The Government decided to provide houses with sanitary conveniences in place of the old ones. Six months later a health officer visited the place and found the village had become as insanitary and filthy as the old one. The sanitary facilities had not been used.

Java is fighting hookworm. They have had two different approaches to this problem. In one area the health authorities decided to enact an ordinance compelling the villagers to build latrines, but it was later

found that the latrines had not been used. On the other hand, there are several villages in which a program of education was developed as to the nature of hookworm and the reasons for the development of sanitation. The people have all equipped their homes with sanitary conveniences and have learned how to use them.

How was this education program carried out? By skilled educators who understand the people and are not too far removed from them in training and interests. The program has been developed by an advisor sent out by the Rockefeller Foundation. A group of teachers called mantris, mostly men but including some women, are trained to carry out this program. They must have been through five grades of school, and as you may know most of the Javanese have not been to school at all. The mantris are taught the facts about hookworm, and at the same time undergo a careful process of selection. If personality, voice, or ability to think and speak clearly do not satisfy, the applicants are dropped from the training group. They go into the homes of the people observing all the social customs of the Javanese; they must be able to use High Javanese and Low Javanese as etiquette requires. Through voluntary conferences with members of the families, the mantris present the practical facts of sanitary living.

The Javanese have learned that this kind of applied hygienic education cannot succeed by means of scattered talks and addresses, or radio broadcasts. Success does arise when the same kind of skill is put into the education process as is put into other phases of public health work. One of the Dutch Colonial officials said to me that he was so impressed by this health education program that he felt it demonstrated a principle which should be applied to all phases of colonial policy, the principle of helping people to grow and progress through their own improved and applied knowledge. Everywhere one finds that the public health administrators who are dealing with groups of this sort are increasingly emphasizing education.

In countries possessing general education, scientific medicine and well-developed public health programs, like our own, we have gone through the stages listed in the allegory, providing curative medicine, emphasizing early treatment, then immunization and sanitation, and finally urging training and instruction in health. We have had preventive medicine, preventive sanitation and now we have preventive hygiene.

Health departments are extending educational activities with the judicious use of the press, the film and the radio. Medical institutions, too, are extending activities along this line. Excellent pioneer work has been

done at food clinics such as the Boston Dispensary. To a much larger extent than the general public realizes, people who have come directly or indirectly under the influence of nutritionists are receiving health education as to their food habits. A sound statement was made by one of your speakers at a recent meeting as to the responsibility of your group in combating menaces to health presented by the charlatan or the quack who foists upon people harmful methods of eating or self-medication.

Perhaps the most significant phase of the health education movement has been the development of health education in the public schools. In this movement, the United States has made a significant contribution. During the last forty years, while public health has been moving toward a greater consideration of the individual, the public school has been moving toward the education of the whole child. It is natural, perhaps inevitable, that school health education should have developed.

As you know, it was in the 1880's that temperance workers established health instruction as a part of the school program. Later in the same decade, under the influence of Mrs. Richards, there began the teaching of dietetics in the schools.

In the 1890's, we first employed school physicians as other countries had done previously. They were concerned primarily with the reduction of school epidemics. Then in the succeeding decade, school nurses were added, largely as the result of the findings of the school doctors and the need for carrying to parents the information unearthed in the examination of their children. With the later addition of dental service, by 1910 there were various health interests in the public schools. Then, with the World War, attention to the health of youth brought the new type of health education which arose as an organized effort, first to use the skill of elementary school teachers to contribute to habits, attitudes and the knowledge of children in the field of mental, physical and emotional health, and secondly, to so organize and interrelate the work of the various health specialists in the school that they would further contribute to the pupils' health training. Many of the important contributors have come from the field of nutrition and dietetics.

Since the war, there has occurred a remarkable development in teaching methods. There has been a complete transformation in the public school textbook, and there has been significant supplementary material in the form of both printed matter and instructional films. It has been reliably demonstrated that health education in schools can produce a change in the mode of living of pupils so far-reaching as to affect the health of the child as measured by his growth. It has also been demon-

strated that these achievements are practicably possible in the average school situation. In fact, we have seen that health education contributes to general education, far from detracting from it.

During this period the teacher-training institutions of America have added to their health training and to their whole health programs. Professionally trained directors of health education, supervisors of health teaching and health counsellors for secondary schools have equipped themselves and entered this pioneer field, where they have made outstanding contributions. The open door policy has been maintained in the development of this new professional group. We have decided just what knowledge of personal and community health, education, and school health administration such an individual should possess. From the fields of general education, biology, nutrition, physical education, medicine and public health nursing individuals have entered this new type of public health work.

During the last year it was possible for me, as chairman of the Health Section of the World Federation of Education Associations, to make a trip around the world in order to bring together a network of school health administrators and those persons primarily concerned with health education in different countries. Through the generosity of the W. K. Kellogg Foundation and other friends of health education in this country, funds have been provided for the establishment of a secretariat within the coming month. It is our belief that these responsible administrators and leaders in different countries may be able to make contributions through coöperative effort in research and comparison of standards.

Some of us believe that world peace can be as effectively promoted by the coöperative efforts of professional people working toward a common ideal, as by the bringing together of people who would enter into academic discussions on the subject. The longer one stays in any nation, the better he likes its people. The differences which tend to separate the people of different nations are superficial. They are differences in manners and in customs. The similarities between the peoples are fundamental. Love of home, the desire to do the best possible for our children, these are international, and if we of different countries can first put our attention on those characteristics which are common between ourselves and other peoples, we will find that we are so nearly alike in most of our interests that the differences between us would appear minor.

The nations of the world are increasingly seeking to use education in the improvement of health and habits. England now provides its teachers with a health education outline. Further developments are

under way in Sweden, Finland, Turkey, Palestine and Egypt. A special committee is working on this problem in France. Leaders in health and in education in India are definitely concerned for the further improvement of their program. The new government in Siam is vigorously extending its activities for the promotion of school health. The Philippines have developed a modern health education program under American leadership. China and Japan have both translated standard American materials dealing with the principles of health education, and health education in schools is one of the outstanding developments in the splendid public health program which is being developed by the National Government of China. Japan has splendidly organized school health services, and at this time is giving specific consideration to the organization of an orderly program of health instruction and training. America has contributed to this development in other countries, and you, in the field which you represent, have reason to be proud of the contribution which has been made by your leaders.

President Glenn Frank has put very clearly the contributions made by two kinds of workers in the field of science, in the following statement: "The knowledge of mankind is advanced by the investigator, but the investigator is not always the best interpreter of his discoveries. . . . The interpreter stands between the layman, whose knowledge of all things is indefinite, and the investigator, whose knowledge of one thing is authoritative. The investigator advances knowledge. The interpreter advances progress. History affords abundant evidence that civilization has advanced in direct ratio to the efficiency with which the thought of the thinkers has been translated into the language of the workers."

This applies most aptly to our own field of work. In no small degree, health, like civilization, advances in direct ratio to the efficiency with which the knowledge of the scientist is integrated into the practices of the people.

EDITORIAL

The Boston Meeting

With a program that will long be renowned for its distinguished speakers and breadth of interest, the Boston meeting will also be memorable because of the following gracious message of good will from the President, Franklin D. Roosevelt, addressed to Katherine Mitchell as president of the American Dietetic Association.

> It is with a great deal of pleasure that I extend my cordial greetings and good wishes to the American Dietetic Association upon the occasion of its nineteenth annual meeting.
>
> With its earnest concern for the health and well-being of mankind the Association has a unique opportunity for national service. More and more it is being recognized that a correct dietary may prevent certain illnesses, cure others and aid in the maintenance of the physical and mental integrity so conducive to fruitful living. So far the activities of dietitians have been directed largely to the welfare of hospital patients, university and other special groups, the conduct of special food clinics and certain valuable commercial interests. There is now need for an orderly expansion of these endeavors. I am convinced that this Association has a most promising future through the continuation of its well directed efforts.

Interestingly enough, on the Saturday preceding the annual meeting, in an address at Omaha, Nebraska, the President again showed his interest and understanding of the problem confronting the doctor, dietitian and nutritionist today—the economic factor as it affects food consumption and in turn the national health.

> Increasing production alone in an unlimited way appeals to no person who thinks the problem through. Increasing consumption must go hand in hand with it. . . . If every family in the United States had enough money to live on what the doctors and dietitians call a "Class A Diet", we would need foodstuffs from forty-five million acres more than we are using today. America's diet is better than that of most other nations, but from the point of view of better national health, it is still inadequate. I seek to increase purchasing power so that people can pay for more food and better food, and in turn provide a larger and larger domestic market for the farmer.

In view of the broad vista of possibilities for national and international service in the furthering of better nutrition, reflected in the words of the President and in the addresses of Mary Swartz Rose, and Drs. Wilson G. Smillie and Clair E. Turner, it is clear that there is "a need for an orderly expansion" of our endeavors. The future looks bright with

opportunities for a continuing and greater service on the part of the dietitian.

Mary Swartz Rose

Mary Swartz Rose has been professor in the Department of Nutrition, Teachers College, Columbia University, since 1921. Her portrait, a reproduction of which appears as the frontispiece of this JOURNAL, was recently presented to Teachers College by her students and co-workers. During the thirty years of her teaching and research in the field of nutrition, she has seen and largely activated the beginning and growth of a new profession—that of the dietitian and the nutritionist. Her professional honors and accomplishments have been many, one of her most recent distinctions having been her appointment to the Technical Commission of the Health Committee of the League of Nations.

Mrs. Rose has achieved a rare combination of talents: she is "a thorough student of nutrition, a teacher who cannot be surpassed in breadth of experience and ability . . . and a very skillful writer." Her boundless energy, alert mentality, intellectual honesty and expert infusing of abstract science into terms of everyday living, has made the subject of nutrition live forever in the minds of her students. More than this, she has that quality of greatness that is ever sensitive to the needs of others. Possessed of an understanding heart and sympathetically attuned to life and its problems, she richly merits the affectionate admiration of her students and co-workers. To have been one of her students is, indeed, an inestimable privilege.

Nutrition as an International Problem[1]

The activities of the League of Nations in the field of diplomacy have vital interest for the whole world, but perhaps even more significant for the welfare of mankind are the movements of the Health Organization of the League, which bring into friendly coöperation those who have as their chief aim the improvement of health.

In the last ten years studies have been made of food conditions in many countries, and several special commissions called to consider problems of international standards for nutritive values of foods and for judging malnutrition. A recent summary of nutrition activities in various countries has attracted wide attention. This report, made by

[1] Abstract of address by Mary Swartz Rose presented to the Community Education section, American Dietetic Association, Boston, October 15, 1936.

W. R. Aykroyd and Dr. Et. Burnet, on "Nutrition and Public Health," when presented to the Assembly of the League in September, 1935, so impressed the delegates that twelve countries requested that nutrition be one of the subjects for consideration at the next Assembly. This was done with the express hope of finding a way to bring about a "marriage of public health and agriculture," for the improvement of both.

The past year has seen much activity as a result of this resolution. A committee representing agriculture, economics and public health, known as the "Mixed Committee," was appointed to make the report to the September, 1936, Assembly, and held meetings in Geneva in February, 1935, and June, 1936, to prepare this document. It also invited many countries to contribute information about the nutrition of their people. The Health Organization of the League appointed a special Nutrition Commission to formulate a working physiological basis as a starting point for the deliberations of the Mixed Committee. The combined report, presented in September, is now published in four parts, entitled *The Problem of Nutrition: Vol. I. Interim Report of the Mixed Committee on the Problems of Nutrition; Vol. II. Report on the Physiological Bases of Nutrition; Vol. III. Nutrition in Various Countries; and Vol. IV. Statistics of Food Production, Consumption and Prices.* Copies may be obtained from the World Peace Foundation, 8 W. 40th St., New York City.

The *Report on the Physiological Bases of Nutrition* endorses a new principle in nutrition, now well recognized by scientific workers but not yet generally appreciated, viz., that physical status can be greatly improved through diet; that the obligation of society is to make it possible for people to have an optimum and not merely a maintenance diet; and that the health of people now accepted as good can be greatly improved.

Another international organization which has been interested in coöperating with the League of Nations in its nutrition activities is the International Labor Conference. Recognizing the importance of good nutrition for workers and their families it, too, appointed a "Committee of Experts on Nutrition Questions." This committee has published a most interesting report entitled *Workers' Nutrition and Social Policy*, also distributed by the World Peace Foundation.

The Mixed Committee's activities have already stimulated various governments to set up some sort of nutrition organization, including Finland, Sweden, Denmark, Mexico, Poland, France, the Netherlands, Uruguay, Jugoslavia and India.

One of the recent field activities of the Health Organization of the

League of Nations is an investigation of nutrition in Chile at the request of the Chilean government.

Among many instances of the need for better nutrition, a striking one is Dr. Aykroyd's account of his study, before becoming director of the Nutrition Research Laboratory at Coonoor, India, of the "Alimentation of Peasants in the Pellagra Area of Moldova, Roumania" made with the assistance of Dr. Alexa and Dr. Nitzulescu. From sixty to seventy-five per cent of the total calories of the dietary in this province, where pellagra is a constant scourge, are derived from corn, and the only kind of meat available to the very poor is fat pork, used merely as a flavoring agent. Long and severe religious fasts also undermine the health of the people: seven weeks of Lent, Passion Week, St. Peter's fast from June 15 to July 1, St. Mary's fast from August 1 to 15, and a Christmas fast of six weeks. Besides this every Wednesday and Friday are fast days on which no animal food other than fish can be eaten (if obtainable!). "A pig for Christmas may be the only meat consumed during the winter." The inadequacy shows most seriously in the women. In four villages, seventy-nine per cent of the women had pellagra, most of them in the child-bearing period.

Economic and Social Factors Influencing the Diet[1]

From the years of her early association with "that great pioneer, Mrs. Ellen H. Richards," Frances Stern traced events on through her later years of service with the industrial worker, all of which led her finally to the realization of a need for the highly specialized service of the food clinic. Prophetic of today's problems was Dr. Mendel's foreword to *Food for the Worker*, written twenty years ago: "How to satisfy varied needs and furnish the indispensable nutrients in a ration that shall be palatable, digestible, liberal in quantity, and still within the purchasing power of the family, is an enormously important problem of applied nutrition." For the present concerted and world-wide interest in this problem of food supply for families of limited means is not an overnight development. It had its inception years ago in the work of pioneers such as Frances Stern.

Whereas once the hospital fed its patients as a part of medical therapy, solely with the aim of restoring them to health, today we see the dietitian in the food clinic continuing this basic purpose and in addition giving her guidance in terms of the patient's *economic* and *social* needs. At the

[1] Abstract of paper presented by Frances Stern to the American Dietetic Association, Boston, October 14, 1936.

same time, through the services of the food clinic, the patient is given some understanding of the principles underlying the food needs of the body, both in health and disease.

With only a firm belief in the great need for a food clinic, with no established precedents, "no money, meager equipment, no standards," Miss Stern developed the first food clinic at the Boston Dispensary, later to serve as a pattern for others in far corners of the United States.

Today, through the interest of health organizations attached to the League of Nations, we see a unified concentration on the economic and social, as well as the physical factors concerned with adequate nutrition. That such considerations are basic in any solution of the problem of adequate nutrition, Miss Stern showed in her discussion of individual cases. How are we going to help the undernourished working girl, if we know little of her working conditions? "The technical conditions of a modern mine, mill, factory or shop affect physiological processes in a profound way. They influence food habits, the appetite of the worker, his craving for special kinds of food, his need for more calorific energy, the time distribution of his meals and so on."

To serve the patient, we must therefore begin with full knowledge of his social and economic background. "Calcium for teeth and bones, and iron for the right percentage of hemoglobin—these alone cannot render the child healthy, mentally as well as physically."

It is a real tragedy that poverty should exist in the midst of plenty for "there is no longer any economic necessity why all members of society should not enjoy the material needs for good health and social well-being."

Nor must we overlook the essentially practical correlation between adequate diet and housing. No more may we blithely order diets, irrespective of whether or not the patient has money with which to buy coal to cook this food, or even utensils in which to prepare it. The everyday needs of the family must be considered for "the minimum adequate diet of the government used by some dietitians and agencies is lowered, automatically, to a restricted diet—no matter what our food prescription is or what the standard of a relief agency—when these other necessities are not considered in determining the allowance."

"Food is an integral part of our lives. The pattern of food behavior in our patient, whether it be good or poor, favorable or unfavorable to dietetic treatment, is the product of his background. It is affected by many factors, chief of which are the income, the struggle for the necessaries of life, for suitable conditions for sleep and rest, cleanliness, a

pleasant home, conditions of employment, opportunities for healthful recreation, reactions to experience."

The community dietitian or nutritionist can exert her influence with the physician, social worker or nurse, and with the student of medicine, dentistry, home economics or social work, by showing them how clearly "health is dependent upon nutrition in terms of social and economic factors, and that adequate food cannot be obtained on a budget that does not consider other needs as well."

Nutritional Cataract

Medical authorities state that there is as yet no effective therapeutic agent for the prevention or cure of cataract. While experimental cataract produced in the rat may be quite different from a senile or other type of cataract in man, yet the lens is opaque in both cases and the mechanism of the change is unknown. The experimental approach with animals that have proved susceptible to this pathological change, promises to yield results of fundamental importance which may ultimately suggest some effective clinical procedure.

Previous to 1930, occasional reference is found to experimental cataract of unexplained or spontaneous origin. Prolonged xerophthalmia resulting from vitamin A deficiency was sometimes followed by lens opacities in the final stage. Vitamin A supplements could not reverse the lens change but the conjunctival and corneal irritation responded promptly. Cataract resulting from a vitamin G-deficient ration was reported by Day and his associates in 1931 and since then numerous reports of further work on vitamin G-deficient cataract have been published. Rats on these rations show retarded growth, keratitis and ophthalmia associated with or preceding the lens changes. Day[1] reports a definite inverse correlation between growth and appearance of cataract. Only a small amount of vitamin G is needed to prevent the appearance of cataract.

Contemporary with the earlier work on rats, Evans and Kern reported a study of cataract in dogs following bilateral thyro-parathyroidectomy—an investigation inspired by numerous reports of disturbed calcium metabolism and a change in other inorganic ions in cataractous lenses. Chaikoff and Lachman reported cataract associated with long standing experimental diabetes in depancreatized dogs. Both of these latter

[1] Day, P. L., and Darby, W. J.: The inverse relation between growth and incidence of cataract in rats given graded amounts of vitamin G-containing foods, J. Nutrition 12: 387, 1936.

investigations involved endocrine disturbances whereas all known nutritional requirements were adequately fulfilled.

The feeding of high levels of lactose, an entirely new and unexpected cause of cataract, was discovered by Mitchell in 1934 and verified by Yudkin in 1935. Subsequent work by Mitchell and others proved that the galactose portion of the lactose molecule was responsible for the metabolic disturbance and that galactose itself was a far more active cataract-producing agent than lactose. The incidence of mature cataract was much greater on galactose rations and cataract developed in a shorter time. Lens changes in these animals were not accompanied by dermatitis, conjunctivitis, or any other gross pathological changes. These original findings have stimulated interest and further work on lactose and galactose cataract in various laboratories. Yudkin contemplates the possibilities of work on larger animals to provide tissue specimens for more detailed study. Day questioned the possibility of a vitamin G deficiency causing a rise in blood sugar as the lactose and galactose rations are known to do. He found no hyperglycemia or glycosuria, however, on his G-deficient rats and concluded that the etiological factor in the two types of nutritional cataract is quite different. Morgan *et al.*[2] noted a hastening of cataract development on lactose rations when a vitamin G deficiency was superimposed. Unpublished investigations by another laboratory have failed to verify these findings. However, the interesting vitamin G-sparing action of lactose warrants further investigations. A difference in susceptibility of different strains of rats was reported by Mitchell.[3] On the 70 per cent lactose ration there was a marked variation in the relative number of mature cataracts developed. On the 35 per cent galactose ration, however, there was a high incidence of cataract in all strains but the time of development to the mature stage was the significant variable. These findings emphasize the necessity for carefully controlled experimental procedure and a relatively large number of observations.

The blood sugar of rats rendered cataractous by lactose or galactose has been studied in at least two laboratories. Day[4] reported much higher blood sugar levels in galactose-fed than in lactose-fed rats but

[2] Morgan, A. F., and Cook, B. B.: Cataract and dermatitis-producing nutritional factors, Proc. Soc. Exp. Biol. & Med. 34: 281, 1936.

[3] Mitchell, H. S.: Susceptibility of different strains of rats to nutritional cataract, J. Nutrition 12: 447, 1936.

[4] Day, P. L.: Blood sugar in rats rendered cataractous by dietary procedures, J. Nutrition 12: 395, 1936.

made no attempt to identify the type of sugar present in the blood. Mitchell[5] found galactose responsible for the entire rise of blood sugar above normal, *i.e.* galactose was present over and above the normal blood glucose. Urinary sugar consisted almost entirely of galactose and was present in greatest concentration in urine of rats on galactose rations.

The question still remains unanswered as to what physico-chemical changes in the lens or its environment are responsible for the precipitation of the lens proteins and the resulting opacities. The fact that cataract has been produced experimentally in animals by recognized nutritional disturbances is of interest to both nutritionist and ophthalmologist, but the possibility of interpreting the current experimental results in terms of human values is still remote.

A Possible Relation of Cancer to Diet

Interesting studies of the possible relation of diet to the rate of growth of malignant tumors have recently been reported by Voegtlin and Thompson.[1] Their studies were based on the well known observations of Osborne and Mendel in 1914 that lysine was an indispensable amino acid for tissue growth but not for maintenance of body weight.

Voegtlin and Thompson secured mice that had been bred to a high degree of susceptibility to mammary carcinoma and subjected them to diets known to be deficient only in lysine. Sources of such deficient proteins were dried milk that had been heated for one hour under fifteen pounds pressure, in contrast to a similar ration in which unheated dry milk was used, or diets in which gliadin in contrast with glutenin was the sole source of amino acids. They were able to demonstrate a marked inhibition of tumor growth as long as the lysine-deficient diets were fed, but an equally conspicuous resumption of rapid growth rate of the tumor when lysine alone was added to the diet. Their results could not be explained by differences in amount of food consumed subsequent to the addition of the lysine.

This work is very interesting but it is too early to predict its applicability to the treatment of human cancer. There would be many practical difficulties facing the physician who attempted to place a patient on a lysine-deficient diet, for an indefinite time, due to the wide distribution of this amino acid in our common foods.

[5] Mitchell, H. S., Merriam, O. A., and Cook, G. M.: The relation of ingested carbohydrate to the type and amount of blood and urine sugar and to the incidence of cataract in rats. In press, to appear in J. Nutrition.

[1] Voegtlin, C., and Thompson, J. W.: Lysine and malignant growth, U. S. P. H. R. 51: No. 42, 1429–44 (Oct. 16) 1936.

CURRENT COMMENT

Nutrition Problems of Maturity and Old Age

Recently the Rockefeller Foundation announced a grant of $42,000 to the Laboratory of Animal Nutrition at Cornell University for the study of nutrition problems of maturity and old age.

In the past, nutrition studies have been largely focused on the rate of growth and apparent health of the young animal. As a rule, such experiments are terminated without the opportunity to observe the effects on the mature animal, but the idea is current that a dietary regime which favors rapid growth will also be favorable to subsequent health, resistance to disease and longevity. Warning against this supposition was sounded in the reports of the White House Conference on Child Health and Protection: "It is not known what the optimum rate of of growth for the child actually is. We do know that increase in the quantity and quality of food may accelerate growth, and in animal experimentation that acceleration has been carried out to a surprising extent. But we must seriously ask the question 'Is the bigger baby a better baby?' If growth is accelerated, do the organ systems of the body keep pace with one another in their development?"

The present day enthusiasm for rapid growth is the more surprising since, as McCay and Crowell[1] have pointed out, a negative correlation between growth rate and longevity has long been suspected. These authors quote, among others, Lord Francis Bacon (1561–1626):

> (1) The cure of diseases requires temporary medicines but longevity is to be procured by diet.
> (2) It seems to be approved that a spare and almost Pythagorean diet . . . produces longevity.
> (3) Animals which come later to perfection (I am not speaking of growth in stature but only of the other steps to maturity as man puts out first his teeth, then his signs of puberty, then his beard, etc.) are longer lived, for it indicates that the periods return in wider circles.
> (4) To grow long and slowly is a sign of longevity and the taller the stature the better the sign. But on the other hand, rapid growth to a greater stature is a bad sign, but to a shorter stature less bad.
> (5) I would have men duly to observe and distinguish that the same things that conduce to health do not always conduce to longevity.
> (6) Again there are other things very beneficial in prolonging life yet they are not without danger to the health unless guarded against by proper means.

[1] McCay, C. M., and Crowell, W. F.: Prolonging the life span, Scient. Monthly 39: 405, 1934.

Despite these ancient theories, little experimental evidence concerning the relation of growth rate to longevity has been obtained. From a study of rats grown and bred in their own laboratory for many generations, Sherman and Campbell[2] concluded that among individuals of the same heredity and sex, in the same environment and eating *ad libitum* of the same food, rate of growth and length of life may vary independently of each other. In an earlier experiment, Robertson and Ray[3] recorded the rate of growth and length of life of mice fed the same diet and concluded that the mice that grew more rapidly lived longer. As the Cornell investigators[4] point out, it is doubtful whether such studies really test the theory, since the slower growing group tends to include the inferior animals that die prematurely.

With this in mind, the Cornell investigators divided their rats into three groups at the time of weaning, so that the groups might be as nearly homogeneous as possible. This plan approaches more nearly the unattainable ideal of offering each individual the same opportunity to grow both rapidly and slowly. In an experiment covering nearly four years, they compared one group of rats which were allowed unrestricted access to food, with two groups which were retarded by limiting the caloric intake and were not allowed to attain maturity until after periods of 766 and 911 days. Their data indicate that the life span of the rat is extended if the growth of the animal is retarded by inadequate calories and if an adequate intake of other essential nutrients is provided. It is of interest that the animals which grew slowly to maturity appeared physiologically young for much longer periods than the rapid growth group.

The work of the Cornell investigators calls attention to the fact that the nutrition problems of maturity and old age can be attacked by means available today in many nutrition laboratories. There are many such problems which remain unsolved. We do not even know with certainty the potential life span of any species. It would be interesting to know why, among rats as well as human beings, the females live longer than the males. Is this related to slower growth? Among rats at least, this difference in favor of the female cannot be attributed to the greater hazards to which the male is subjected.

[2] Sherman, H. C., and Campbell, H. L.: Rate of growth and length of life, Science 80: 547, 1934.

[3] Robertson, T. B., and Ray, L. A.: On the growth of relatively long lived compared with that of relatively short lived animals, J. Biol. Chem. 42: 71, 1920.

[4] McCay, C. M., Crowell, M. F., and Maynard, L. A.: The effect of retarded growth upon the length of life span and upon the ultimate body size. J. Nutrition 10: 63, 1935.

Most of the gains in lengthening the expectation of life have come through decreasing mortality among infants and children. Little progress has been made in reducing the causes of mortality incident to maturity and old age. Since it has been shown that dietary factors may be responsible for heart lesions in experimental animals,[5] one is led to inquire whether nutrition may possibly have a bearing on the incidence of heart disease as a cause of death. What can nutrition in adult life do toward the prolongation of maturity and postponing the onset of senility? Can the aging process be controlled by diet?

It is of interest that in addition to continuing their longevity studies, the Cornell investigators propose to study adult nutrition in animals that have been reared to maturity in the same way. This should be a fruitful field for investigation. It is to be hoped that other investigators will be stimulated to experiment along these lines, as well as to preserve some of the animals used in growth studies for longer observation, so that in the future the nutrition problems of maturity and old age will receive the consideration which they deserve.—HAZEL M. HAUCK, *Professor of Home Economics, Cornell University, Ithaca, N. Y.*

CURRICULUM STUDY ON NURSING EDUCATION

The tentative revision of the outlines in dietetics for student nurses, discussed at the annual meeting in 1935, was used during the past year by five collaborating schools and reviewed by thirty study groups representing a wide geographic distribution. The study groups were composed of nurses and dietitians, with the latter predominating. It is estimated that at least 150 dietitians have taken part in the work of revision under the direction of the National League of Nursing Education.

There was rather general approval of the placement of the courses, the teaching personnel and teaching facilities, and the total time allotment, but many suggestions as to the distribution of time among the units and between class and laboratory. Although a range of hours has been specified for each unit, it is to be understood that this arrangement can be modified according to the judgment of the instructor. The three-hour laboratory period for nutrition, foods and cookery received only very meager support, preference being given to the two-hour period.

The main issues brought forth by the criticisms from the field were concerned chiefly with (1) subject matter content and (2) organization.

[5] Cornell Agr. Expt. Sta. Memoir 178, 1935.

In this report only the major controversial points with decisions and reasons for the decisions can be given.

A fairly large number of reviewers believed that the subject matter content was too advanced for the student nurses' science background. The prerequisite chemistry and physiology courses of the new curriculum devote 18 to 24 hours to physiological chemistry and 45 to 50 hours to metabolism, respectively. Therefore the student should be ready for such advanced information as will give her a scientifically sound and practical knowledge of nutrition in health and disease. Most of the discussion on the chemistry of foods and digestion, formerly included in the first nutrition course, has been omitted, and such material incorporated as will give special emphasis to those principles and procedures of greatest value to the student as an individual, a nurse and a teacher of health.

Since emphasis should be placed on fundamental principles of cooking, it would seem that considerable choice could be allowed in the selection of the foods whose preparation will illustrate these principles.

The keynote of the new plan of organization is integration. In an attempt to promote the attainment of the educational aim of adjustment or of bringing into right relationship the various factors in any situation, special effort has been made to organize the course materials in such a way that they will be presented at the time and in the manner they are to be used. The subject matter of the nutrition, foods and cookery course has been grouped around the six fundamental principles of good nutrition. The course material has been divided into seven units. The first is introductory; each of the remaining six units deals with one of the requirements of an adequate diet. The laboratory work has been closely correlated with the class work. It should be emphasized, however, that neither the sequence of units nor the order of topical arrangement within each unit are to be construed as rigid.

The study of child nutrition has been integrated with the course in nursing of children and thus the student learns about the nutritional needs of children, both sick and well, while she is caring for them. She should also receive experience in the preparation of infant formula and children's diets, under the supervision of the dietitian, while on pediatric service.

The course in diet therapy, although a continuation of nutrition, foods and cookery, can rightly be regarded as an integral part of "Medical and Surgical Nursing" and whenever possible should be so taught. Integration of these courses will tend not only to eliminate much of the

repetition commonly found when diet therapy is handled separately, but will show clearly to the student when and how the normal diet must be modified, and the therapeutic reasons for the modifications. The result will be understanding rather than memory.

Diet therapy practice should parallel or at least immediately follow the completion of the class work and should promote an understanding of basic concepts, principles, relationships and generalizations, rather than the mere acquisition of facts. It should be received in the diet kitchen and wards when possible, or ward experience supplemented with laboratory work may be substituted for diet kitchen experience.

During the foundation course in nutrition, foods and cookery, mention is made of the dietary requirements during normal pregnancy and lactation. Then when the student is offered the course in obstetrics, the discussion of this subject is reëmphasized and enlarged to include a discussion of the modifications necessary for abnormal conditions.

In like manner, during the first course, the student is given a general knowledge of how to plan and prepare a day's meals for the family group. But while being taught nursing and health service in the home, she is given more specific instruction and some practice in dealing with the culinary problems of families on various income levels.

Nutrition conferences designed to bring about a close integration of nutrition with the nursing care of the patient should be held at suitable times throughout the entire nursing program. It is essential that the teaching be done as part of the student's nursing studies, and that the dietitian, therefore, teach on the wards, closely relating her work to the nursing instruction that is going on at the same time. The approach should be quite informal, giving the student every opportunity to present her observations in the light of her knowledge of theory, and to participate in the discussion. The type of conference may be individual or group.

The following summary gives a short description of each nutrition course with time allotment and placement in the nursing program:

Nutrition, foods and cookery

1. *Basic Course*, 40–60 hours, deals with normal nutrition and composition of foods with laboratory practice in the preparation of common foods. Placement—second term of the first year.
2. *Child Nutrition*, 5–10 hours, deals with optimum normal diet for the child at different age levels, and the modification of the normal diet for various diseases.

Placement—integrated with "Nursing of children", given in the second or third year.

3. *Nutrition in Nursing and Health Service in the Family*, 2–4 hours, deals with the adaptation of the normal adequate diet to the family and includes food cost studies. In addition there are individual conferences and supervised experiences.
   Placement—integrated with "Nursing and Health Service in the Family", given in the third year.

Diet therapy

1. *Basic Course*, 30 hours, deals with the modification of the normal diet in various diseases.
   Placement—integrate or parallel with "Medical and Surgical Nursing", which begins in the third term of the first year.
2. *Diet Therapy Practice*, 6–10 weeks, consists of supervised experience in the diet kitchen and wards.
   Placement—at the same time that lectures are being given or immediately following the completion of the lectures.
3. *Diet Therapy Laboratory*, 12–14 hours in addition to class work, deals with the preparation of therapeutic diets. It is offered to supplement ward experience when diet kitchen experience is not available.
   Placement—concurrently with lectures.
4. *Diet in Pregnancy and Lactation*, 3–5 lectures, deals with special dietary requirements of these periods. In addition there are clinical conferences and attendance and participation in the teaching of mothers' classes.
   Placement—integrated with "Obstetric Nursing", given in second or third term of second year.

Clinical conferences

Clinical conferences in nutrition are designed to bring about a close integration of nutrition with the nursing care of the patient. They are to be held at appropriate times, in connection with ward teaching, throughout the entire nursing program.

—SISTER VICTOR, *St. Mary's Hospital, Rochester, Minn.*

UP-TO-DATE AND ON TIME

The American Dietetic Association prides itself on being up-to-date. No one could have attended the Boston meeting without noting the progressive spirit, and the marked professional interest. We may well be proud of our members and their accomplishments but when our up-to-dateness is measured by the clock as well as the calendar, our score must drop. The Association has not yet acquired that modern radio stimulated virtue of time-consciousness, or am I mistaken—is it merely a latent virtue needing encouragement?

Why should we not face the problem squarely before another Annual Meeting? Officers, committee chairmen, program committee, presiding officers, members—all are included—because no one group alone can accomplish a break in that seasoned but unwelcome tradition of tardy beginnings and tardy endings. Other organizations have taken drastic action to conquer the problem—why not ours? Our friends and supporters would all commend us, our guests would not object to slight restrictions.

These few suggestions—not original—may serve to call forth better ones or further comment.

I propose that: (1) section and committee reports be consolidated or condensed; (2) round table discussions be limited strictly to scheduled hours; (3) all speakers be confined to time allotted on the program; (4) signal lights be placed on speakers' desks as the least obnoxious device for time warning; (5) no more speakers be scheduled than time permits; (6) time intervals be allowed between scheduled meetings; and (7) members coöperate by prompt attendance.

What could be a better beginning for our twentieth year than to initiate this third decade with an up-to-date adherence to time schedules at the Richmond meeting?—HELEN S. MITCHELL, *Research Professor (Nutrition), Massachusetts State College, Amherst.*

BOOK REVIEWS

Applied Dietetics. By Frances Stern. Baltimore: The Williams & Wilkins Company, 1936, pp. 263, price $3.50.

Written by one with long and noteworthy practical experience in applying dietetic principles, Miss Stern's new book, "Applied Dietetics", is aptly named. It presents in a concise, useable form, the material which the student of nutrition requires in order intelligently to prescribe or execute a diet. The realization that a patient is an individual with social, environmental and financial problems peculiar to himself and must be treated accordingly, is a point well taken and the chapter devoted to "Environmental Factors that Influence the Effectiveness of the Diet" should certainly be given the consideration it deserves. One feels this phase is all too frequently neglected. The table showing the "Food Practices of Some Foreign Peoples" should likewise prove illuminating and suggestive, and the tabulation of total specific food requirements for individuals of different ages and activities based on the Steibling Diet II is of great value.

The "dietary outlines" indicating the affected part, the physiology and the necessary adjustment of the normal diet in various disease conditions is again an extremely valuable contribution.

Perhaps the author's own summary outlines most effectively the well planned contents of the book as follows: "the principles of nutrition underlying the planning of a diet, normal or therapeutic; environmental conditions that may influence the effectiveness of the diet; methods and materials helpful in the education of the patient in terms of his mental capacity and his ability to carry out the diet; tables and charts to simplify the computation of a diet; a series of dietary outlines showing that the therapeutic diet is a modification of the normal diet, compensating for changes in the body caused by disease or abnormal conditions; and typical diets and menus illustrating the food necessary to supply the food constituents required for the normal diet and variations in the therapeutic diets."—ESTELLE E. HAWLEY, PH. D., *The University of Rochester and Strong Memorial Hospital, Rochester, N. Y.*

Physiological Chemistry. By J. F. McClendon, Ph.D., and the late C. J. V. Pettibone. St. Louis: The C. V. Mosby Company, 1936, pp. 454.

All the chapters in this new edition have been largely or entirely rewritten, while the following three are new additions to the contents: Enzymes, Energy Exchange, and Internal Secretions. Many new figures are included. The laboratory work, covering over a hundred pages in Part II, is well adapted to the text.

The arrangement is suited to the needs of the student with some knowledge of general and organic chemistry. The method of presentation is clear, concise and graphically interesting: "Owing to the number of chemical reactions in the body the general bookkeeping is done in terms of energy". And in the section on Internal Secretions: "The word cretin is said to be derived from Christian. Cretins are, as a rule, quite friendly and childlike. Their joints do not function properly, leading to a slouching gait. Their mental deficiency leads to their economic dependence, and they usually live in charity institutions".

The publishers rightly claim that the material is presented in a smooth and logical arrangement. There are no high and low spots in the book. Attractively bound, written by a man of unquestioned standing in his field, and further sanctioned by the suggestions and criticisms of Dr. W. C. Rose, the book merits continued success in its field.

Epidemic Amebic Dysentery. Published as Bulletin No. 166 of the National Institute of Health, and for sale by the Superintendent of Documents, Washington, D. C., price 20 cents.

Covers the epidemiology, clinical data, control and engineering problems in connection with the Chicago epidemic of 1933. Conclusions are that the outbreak had its origin in two hotels; that flies played no part in the spread of the infection; that polluted ice did not significantly contribute to the occurrence of the epidemic; that "food directly contaminated by carriers among the food handlers in the two hotels was not of major importance in the production of the outbreak"; and that water was the chief effective agent in the spread of this infection, the pollution occurring through cross-connections between sewage and water pipes and through leakage from an overhead sewer into the cool drinking water tank. "A contributing factor was the heavy infestation with *E. histolytica* of hotel employees".

Manual of Diets, 2d. edition. New York City: Montefiore Hospital, 1936, pp. 31, price 50 cents.

These special therapeutic diets were prepared under the auspices of the hospital's medical board by its committee on nutrition, with the collaboration of Lenna F. Cooper and members of the department of nutrition. This is a well arranged, concise yet complete collection of standard diet prescriptions.

The Alice Bradley Menu-Cook-Book. By the Principal of Miss Farmer's School of Cookery, Inc. New York: The Macmillan Company, 1936, pp. 241, price $1.50.

This is number two in the series, covering the months of January, February and March, and following the plan of the first in the series of four reviewed in this JOURNAL for November, 1936. The weary planner of menus should get many a lift from these three months' menus. The recipes and directions for the preparation of each dish are designed to make the labor of cooking as simple, speedy and easy as possible.

The Problem of Nutrition, Vol. III—Nutrition in Various Countries. Document A. 12 (b) 1936. II. B. Geneva: League of Nations, 1936, pp. 271. Price $1.40. **Vol. IV, Statistics of Food Production, Consumption and Prices.** 1936, pp. 110. Price $0.75. For sale by World Peace Foundation, 8 West 40th Street, New York.

Herein is submitted a factual basis for a survey of this important question of nutrition in both urban and rural districts throughout the Western world.

The report outlines the measures recently taken by governments, public authorities and national organizations in some twenty countries, in order to bring about an improvement in the dietary of their populations. These are grouped in chapters devoted to measures taken on behalf of mothers and infants; children of school age and young people; and in particular of unemployed adults; army and navy dietaries; measures to enable particular categories of consumers to obtain foodstuffs at reduced prices; for ensuring the quality of foodstuffs; and research, education and popular instruction with regard to food values.

The report contains evidence on variations which have occurred in the consumption of foodstuffs in recent years in both advanced and less prosperous communities. Its editors conclude that "taking a general view of countries like the United Kingdom, France, Switzerland, Belgium and the Netherlands, the question of general food shortage is not a matter for anxiety. It is true that, among industrial or agricultural workers who have been particularly hard hit by unemployment or trade depression, large numbers may be underfed as the result of lack of purchasing power, in spite of the considerable efforts made to assist them. For the great majority of the population, however, the nutrition problem—though at first a problem of income—is in the main a problem of quality, balance of diet, hygiene and education."

Volume IV issued by the League on the problem of nutrition is a preliminary study by the International Institute of Agriculture at Rome of the available statistical material on the production, consumption and prices of the chief protective and other foodstuffs, e.g., milk and dairy products, meat, eggs and poultry, fruit and vegetables, cereals and sugar. Despite its preliminary character, this volume represents the first serious attempt to gather together and digest the somewhat fragmentary statistical informa-

tion available on the vitally important question of protective foodstuffs.

Industrial Environment and Health: Practical Methods of Investigation. Published by the International Labor Office. New York: World Peace Foundation, 8 West 40th Street, 1936, pp. 336. Price $2.00.

This volume is for the use of medical inspectors and other health workers in factories, and is fully illustrated. It includes such subjects as measurement of atmospheric pressure, temperature, and noise; humidity and cooling power; ventilation; photometry; and industrial toxicology. It is a companion volume to the encyclopaedia *Occupation and Health*, published by the Correspondence Committee on Industrial Hygiene.

Quarterly Bulletin of the Health Organization. Geneva: League of Nations, September, 1936, pp. 570. Distributed by the World Peace Foundation, 8 W. 40th St., New York City.

This number includes the Technical Commission's *Report on the Physiological Bases of Nutrition* (reviewed in this JOURNAL for November) as well as the report of the Commission's second session in Geneva, June, 1936. Then follows a lengthy article on "The Protein Component in the Human Diet" by Emile F. Terroine. In his conclusions he states: "there is no *need* to include proteins of animal origin in the diet of man, whatever the stage of life considered and whatever the nature of the needs to be satisfied". An equally dogmatic statement appears on page 480, when the author quotes "an eminent physiologist" to this effect: "Take care of the calories and the protein will take care of itself" and adds "This statement remains wholly true". Later on, the writer modifies his earlier statements with: "Save in the exceptional case of a monotonous diet . . . once energy requirements have been met, all nitrogen needs will have been satisfied . . . for all purposes—maintenance, growth, pregnancy and lactation". Sections follow "On the Necessity for a Biological Supervision of Food", by Mme. G. Lucie Randoin; "Research into Biological Measurements and Tests for the Definition of States of Malnutrition", by Henri Laugier; "Clinical Methods for Determining the State of Nutrition in School-Children", by P. Nobécourt and G. Vitry; and data relating to nutrition in the Netherlands. In addition sections are included on nutrition in the first year of life in childhood and in puberty. It is confusing to find so little rapport between the conclusions of the Technical Commission and those of the writers of some of the following sections of this Bulletin. Gorter and De Lange allow milk not to exceed 0.75 litre during the first year of life, and while permitting diluted, small quantities of wine at age 6 or 7 and milk with a "dash of tea or coffee" for the four-year-old's breakfast, there is no clear statement as to the exact amount of milk allowed or advised per day.

Menus and Recipes for Lunches at School. U. S. Department of Agriculture, Misc. Pub. No. 256. Washington: Superintendent of Documents, 1936, pp. 25. Price 10 cents.

Here are presented recipes for soups, hot dishes, cookies and sandwich suggestions for nursery school children and those over five years of age, with comment on what foods children need and how to purchase supplies for the school lunch room. The booklet also contains a table developed by the Merrill-Palmer School, showing average size of servings for different foods for children of various ages. The information given is convenient for schools where equipment is limited and economy is a necessity.

Dietetics As an Occupation, by Cleo Murtland. New York: National Occupational Conference, 551 Fifth Avenue, 1936, pp. 9. Price 10 cents.

In explaining the purpose behind the publication of this pamphlet, we quote the foreword: "Some facts about occupations are generally true for the country at large. Others vary according to locality. It is the purpose of this publication briefly to summarize what is known about this occupation from a national point of view. This should be supplemented by local data regarding opportunities for employment, entrance

requirements, working conditions, earnings, etc."

Of the 53 references listed in the bibliography "designed to include all recent literature", 29 refer to articles published from ten to twenty-one years ago. In the bibliography, but one issue (November 1934) of the JOURNAL of the American Dietetics (sic) Association is listed. There are inaccuracies in listing of reference numbers. For example, the reference number (54) for statement of American Dietetic Association membership does not appear in the bibliography.

A dietitian is defined as "a person trained to apply this science to the planning and preparation of foods for patients, undernourished persons, and those who need to protect their health by means of diet". "Research workers are usually nutritionists" yet the author does not otherwise define the term "nutritionist".

The author says: "Since the training of the dietitian is given in college and on the graduate level for those who become qualified dietitians according to the standard established by the American Dietetics Association, it seems essential that teachers, counselors and pupils familiarize themselves with the college subjects and hospital apprenticeship requirements not given in texts. High school pupils may qualify scholastically for college work, but they will probably be half through a college course before their fitness for the work of the dietitian is established. Vocational information as such fails to point out this fact or to call attention to sources of information that furnish it".

Under the question "How Many Persons are Employed in this Occupation?" the author states that "men are employed only in research. Women are included with 'other occupations' under 'other professional pursuits' in the United States Census". After briefly discussing duties, preparation, training, probable future trend of employment, salaries "or other rewards", and advantages and disadvantages of the dietitian's work, Miss Murtland concludes that: "the future of the hospital dietitian seems assured. With the absorptive power of the occupation well below the saturation point, employment is reasonably certain for those who qualify".

Little Gold Business Books. Stamford, Conn.: Hospitality Guild, 1936. Price 50 cents each. "Dining Room Management for the Head Waitress and Hostess", by J. O. Dahl. "No. 1 Ideas from 1000 Menus", by J. O. Dahl. "Book of 52 Popular Soups", by J. H. Breland.

All three of these booklets may be recommended as helpful handbooks for the dietitian.

Applied Dietetics. By Sanford Blum, M.D. Philadelphia: F. A. Davis Company, 1936, pp. 408. Price $4.75.

Here the publishers and the author have attempted a bit of literary face-lifting. Dr. Blum's *Practical Dietetics* reviewed in fourth edition in this JOURNAL, November 1932, reappears more or less "as is", except for scattered touches of plastic surgery applied here and there, as a first edition of *Applied Dietetics*. Like most rejuvenation processes, the result will probably deceive no one but the hopeful owner of the reconstructed surface.

The outline plan of diets, while having the merit of simplicity, manages to convey a faint flavor of the 90's. For instance, under "fattening diet" we have two plans: one for the "frail young mother"; one for "spinster with impaired digestion". The chief distinction between the two seems to be that mother has her breakfast in bed while spinster must be up betimes and out working in the garden at 9:00 A.M. Other equally fascinating diet outlines are for "strengthening diet" for "ill-nourished, broken down farmer"; another "to retain the figure of youth in an unoccupied woman past forty", and a nutritious diet for "stock broker under nerve strain". But the nicest of all, in our opinion, is for a "spare adult male—impaired digestion". We've always had spare tires, spare time and spare ribs, now we have a spare male as well as a book on diet to spare.

CURRENT LITERATURE

American Journal of Digestive Diseases and Nutrition

Vol. 3, November, 1936

* Anemia and the gastro-intestinal tract: a synopsis. G. R. Minot.—p. 643.
* Specific food sensitiveness. W. C. Alvarez.—p. 693.
Certain newer methods of treating peptic ulcer. A. B. Rivers.—p. 698.

ANEMIA AND THE GASTRO-INTESTINAL TRACT. Iron in food is present as ferric iron. The normal availability of food iron is sometimes less than 50 per cent of the iron contained in a given food. Certain mixtures of food may handicap the absorption of iron. The types of anemia due to a deficiency of material derived from food will not arise with a healthy intestinal tract, a proper diet for the needs of the given individual at each period of life, and with the absence of abnormal blood loss or factors acting to inhibit nutrition. Much suffering from anemia can be prevented if every person takes an optimal diet throughout life. There is an important interrelation of food, stomach, and intestine in the maintenance, not only of blood, but also of the integrity of the normal individual.

SPECIFIC FOOD SENSITIVENESS. Patients must not be left too long on narrow elimination diets; such diets are for testing and should show results in 48 hours. Some cases of diarrhea and pseudo-ulcer are due to the milk that is taken by way of treatment, and not infrequently certain foods irritate or greatly depress the brain. Somnolence after meals can be due to a particular food, and canker sores in the mouth can be produced by food. Food sensitiveness is not necessarily allergic or due to protein. This may be the reason skin tests are of little help in finding the foods that cause indigestion.

American Journal of Diseases of Children

Vol. 52, October, 1936

* Respiratory metabolism in infancy and in childhood: XVIII. The respiratory exchange in premature infants—basal metabolism. H. H. Gordan and S. Z. Levine.—p. 810.
* Estimation of vitamin D in blood serum. J. Warkany.—p. 831.

RESPIRATORY METABOLISM. The basal metabolic rate of premature infants expressed in calories per kilogram closely approximates and, in calories per square meter, is less than that of full term infants of a comparable age.

VITAMIN D IN BLOOD SERUM. After oral administration of 0.1 cc. of viosterol to rabbits there is an elevation of the vitamin D level within 6 hours. The maximum level is reached after 24 hours and is maintained from 3 to 4 days. The content then slowly decreases and after from 4 to 6 weeks returns to normal.

American Journal of Nursing

Vol. 36, October, 1936

The rôle of the endocrines. C. R. Gross.—p. 1011.

American Journal of Public Health

Vol. 26, November, 1936

* Experimental staphylococcus food poisoning: a study of the growth of a food poisoning staphylococcus and the production of an enterotoxic substance in bread and meat. F. C. Kelly and G. M. Dack.—p. 1077.
* The question of acid and alkali forming foods. J. A. Tobey.—p. 1113.

FOOD POISONING. Experimental food poisoning has been produced in human volunteers by feeding either bread or meat in which a "food poisoning" strain of staphylococcus has grown. One individual who ate bread containing millions of these staphylococci developed severe food poisoning symptoms, suffering severe prostration lasting 13 hours. The same organism growing in ham caused similar characteristic reactions in a second volunteer.

ACID AND ALKALI FORMING FOODS. Eighteen pounds of oranges would be required in the diet at one time to bring about a shift of the blood toward greater alkalinity and 4½ pounds of lean beef or 2 pounds of oysters would be necessary to lower the pH by even 0.2. The buffer action of the blood, the lungs and the kidneys serves as a defense mechanism to keep the blood at a constant

pH. There is no scientific evidence to indicate that any food or combination of foods can significantly alter the acid-base balance in a normal individual.

American Journal of the Medical Sciences

Vol. 192, October, 1936

* Gout—a forgotten disease. W. W. Herrick and T. L. Tyson.—p. 483.
Gout. A. Cohen.—p. 488.

Vol. 192, November, 1936

* Protamine insulin in the treatment of diabetes mellitus. W. R. Campbell, A. A. Fletcher and R. B. Kerr.—p. 589.
* Relation of physical defects to nutritional impairment, based on the examination of 30,000 children of 21 states. Physical measurement studies No. 5. W. M. Gafafer.—p. 669.
* Higher carbohydrate diets in the treatment of diabetes. F. B. Peck.—p. 697.

GOUT. All cases of recurrent acute joint inflamation with intervening free intervals, especially in patients of middle age, demand careful search for a family history of gout and a study of the uric acid content of the blood. Six cases of gout are summarized. In every case, treatment with diet and colchicin brought about a prompt relief of the arthritic symptoms in 24 hours.

PROTAMINE INSULIN IN DIABETES. With its prolonged action protamine insulin is much more suitable than regular insulin for endogenous metabolism, and for accomplishing rest of the pancreas. Protamine insulin may be of value in protecting and improving the carbohydrate tolerance of the patient with acute diabetes.

RELATION OF PHYSICAL DEFECTS TO NUTRITIONAL IMPAIRMENT. Examination of approximately 30,000 white children, ages 6 through 14 years, showed that about one-half of the children had one or more recorded physical defects, principally carious teeth, defective tonsils and adenoids. Six and one-half per cent of the boys and 10.2 per cent of the girls with physical defects had a nutritional status that was judged poor or very poor. Evidence indicates that physical defects are associated with nutritional impairment.

TREATMENT OF DIABETES. Evidence in favor of carbohydrate diets in diabetes seems well established, both clinically and experimentally. The patients on a high carbohydrate diet felt better and were more comfortable. The diet was cheap and an apparent increase in the efficiency of insulin resulted. Coma mortality was practically abolished and other complications were more easily managed.

Archives of Internal Medicine

Vol. 58, October, 1936

* Exercise in diabetes mellitus. A. Marble and R. M. Smith.—p. 577.
* Cholesterol content of blood in diabetic patients fed diets rich in fat. R. H. Freyberg, L. H. Newburgh and W. A. Murrill.—p. 589.
* Effect of prolonged dietary restriction on patients with cardiac failure. S. H. Proger and H. Magendantz.—p. 703.

Vol. 58, November, 1936

* Clinical significance of the cholesterol partition of the blood plasma in hepatic and in biliary diseases. E. Z. Epstein and E. B. Greenspan.—p. 860.

EXERCISE IN DIABETES. Exercise of short duration causing only mild fatigue brought about a definite and often a marked increase in the concentration of sugar in the blood of young patients with severe or moderately severe diabetes who had not received food or insulin for several hours. Protamine insulinate keeps the level of the blood sugar of the patient with severe diabetes more nearly normal for a greater part of the 24 hours. Exercise should exert a lowering effect on the blood sugar level of patients using protamine.

CHOLESTEROL IN DIABETES. The fasting blood cholesterol values in 21 controlled diabetics averaged 176 mg. while normal control subjects showed values 20 mg. less. The level of cholesterol in the blood of these diabetic patients could not be correlated with the amount of fat in the diets. Lack of control of the diabetes appears to be the major factor in the causation of hypercholesteremia in diabetic patients.

DIET IN CARDIAC FAILURE. The dietary restriction for the 6 patients with severe congestive heart failure was such as to effect a

loss of weight of approximately 10 per cent over 2 or 3 weeks. The effects attributable to dietary restriction were further slowing of the heart rate, a decrease in the systolic and the diastolic blood pressure, a decrease in the respiratory rate, cardiac work and in the size of the heart. The nitrogen balance was negative during this period of extreme dietary restriction (356 calories).

Archives of Pediatrics

Vol. 53, October, 1936

* Mental health and the growing boy and girl. F. J. Farnell.—p. 697.

MENTAL HEALTH. The successful cultivation of a healthy, tolerant mind, free from prejudice, free from fears and free from pettiness is the one ideal of success that cannot be taken away from us. Today, knowledge is dangerous, for we are too rich in machinery and too poor in our purpose. It follows that we are submerged by a disorderly individualism running riot and reflecting its chaotic character in our national make-up.

Journal of Biological Chemistry

Vol. 115, October, 1936

* Glycogen disappearance and carbohydrate oxidation in hypophysectomized rats. R. E. Fisher, J. A. Russell and C. F. Cori.—p. 627.
* Comparison of glycine and guanidoacetic acid as a precursor of creatine. M. Bodansky.—p. 641
* The partition of reduced ascorbic acid in blood. D. J. Stephens and E. E. Hawley.—p. 653.
* Further studies on the calcium content of the body in relation to the calcium and phosphorus content of the food. L. B. Whitcher, L. E. Booher and H. C. Sherman.—p. 679.
* The effect of liberal intakes of calcium or calcium and phosphorus on growth and body calcium. E. W. Toepfer and H. C. Sherman.—p. 685.

Vol. 116, November, 1936

* The carbohydrate metabolism of brain. II. The effect of varying the carbohydrate and insulin supply on the glycogen, free sugar, and lactic acid in mammalian brain. S. E. Kerr and M. Ghantus.—p. 9.
* Studies of the copper and iron content of tissues and organs in nutritional anemia. M. O. Schultze, C. A. Elvehjem and E. B. Hart.—p. 93.
* Studies on the copper content of the blood in nutritional anemia. M. O. Schultze, C. A. Elvehjem and E. B. Hart.—p. 107.

GLYCOGEN DISAPPEARANCE AND CARBOHYDRATE OXIDATION. Hypophysectomized rats suffer a defect in the mechanism by which normal carbohydrate oxidation is depressed and carbohydrate levels thereby maintained during fasting. Extracts from the anterior lobe are able to restore this function, apparently by exerting a depressing effect on carbohydrate oxidation.

PRECURSORS OF CREATINE. The results of this study furnish additional evidence for the conversion of guanidoacetic acid into creatine, but do not support the contention that glycine is a precursor of creatine.

ASCORBIC ACID IN BLOOD. The concentration of ascorbic acid is higher in the white blood cells than in whole blood plasma or red blood cells. Unusually high values observed in the whole blood of subjects with leucemia were shown to be due to the preponderance of leucocytes.

RELATION OF FOOD CALCIUM AND PHOSPHORUS TO BODY CALCIUM. Increase in the calcium content of the diet to 0.53, 0.70, 0.84, or 1.04 per cent, respectively, did not bring about any distinct increase in the rate of calcification of the body. When the phosphorus content was increased by the addition of dicalcium phosphate, only small increases in the rate of calcification were observed. The animals on these different dietaries showed no significant differences in body length at a given age.

EFFECT OF LIBERAL CALCIUM AND PHOSPHORUS INTAKE. Increase in the calcium and phosphorus content of an already adequate diet for albino rats resulted in more rapid and more efficient growth with greater economy in the use of the food. The rate of normal calcification as shown in the young of the second generation was also distinctly increased. Increasing the calcium content of an already adequate diet to 0.8 per cent of the dry weight of the dry food mixtures has not revealed any favorable result.

CARBOHYDRATE METABOLISM OF BRAIN. The glycogen content of the cerebrum of

normal animals averages 98 mg. per 100 gms. in well fed and fasting dogs, and 82 mg. in rabbits. Overdosage of insulin caused a marked decrease in the brain glycogen of dogs and rabbits. The free sugar of brain was constantly lower than that of blood, except in extreme insulin hypoglycemia.

COPPER AND IRON CONTENT OF TISSUES. When severely anemic rats are markedly depleted of bodily copper stores, feeding of iron and copper for 7 days causes only a small retention of copper, although maximum hemoglobin formation is observed. Young pigs suffering from both iron and copper deficiency cannot form hemoglobin and erythrocytes when pure iron alone is supplied.

COPPER IN BLOOD. In pigs suffering from nutritional anemia due to iron and copper deficiency, the copper content of the blood falls to extremely low levels. Feeding 2 to 4 mg. of copper per day together with iron results in a very rapid and significant increase in the copper of the blood. Continued hematopoieses cannot take place unless the copper content of the blood is maintained above a minimum level.

Journal of Nutrition

Vol. 12, October, 1936

* Metabolic studies of Eskimos in the Canadian Eastern Arctic. I. M. Rabinowitch and F. C. Smith.—p. 337.
* The inverse relation between growth and incidence of cataract in rats given graded amounts of vitamin G-containing foods. P. L. Day and W. J. Darby.—p. 387.
* Blood sugar in rats rendered cataractous by dietary procedures. P. L. Day.—p. 395.
* Comparison of the biological and chemical methods for the determination of vitamin C in canned strained vegetables and a study of its variation from year to year. F. Hanning.—p. 405.

Vol. 12, November, 1936

* The distribution of vitamin B_4 in some plant and animal products. O. L. Kline, H. R. Bird, C. A. Elvehjem and E. B. Hart.—p. 455.
* The response of rats, chicks and turkey poults to crystalline vitamin G (flavin). S. Lepkovsky and T. J. Jukes.—p. 515.
* The antirachitic value of irradiated yeast in infants. T. G. H. Drake, F. F. Tisdall and A. Brown.—p. 527.

METABOLIC STUDIES OF ESKIMOS. Retention of nitrogen in the blood appears to be a physiological phenomenon among these Eskimos and is apparently due to the high protein diets. In spite of the high concentration of chlorides in plasma, the urine chlorides were extremely low. The basal metabolic rates of these Eskimos appear to be high. It is possible that the metabolism of fat may be different from peoples elsewhere for there is an absence of ketosis in spite of the high fat diets. The rarity of rickets among these people appears to be due to the long periods during which infants are breast fed and the fact that the vitamin D content of seal oil is equal to that of the best cod liver oil.

GROWTH AND INCIDENCE OF CATARACT. There is an inverse relationship between growth and the appearance of cataract in young rats. These data indicate that only a small amount of vitamin G is required to prevent the appearance of cataract.

BLOOD SUGAR IN DIETARY CATARACT. Young growing rats were given adequate diets containing various carbohydrates as 60 per cent of the diet. Seventeen out of 18 rats receiving lactose developed cataract at an average time of 44 days. The 3 rats receiving galactose exhibited cataract on the eleventh day. Glucose, sucrose and starch did not cause cataract. It may be significant that the sugar that caused cataract in the shorter period (galactose) also produced the highest blood sugar levels. Cataract was produced in young growing rats by a diet deficient in vitamin G. This was easily distinguished, with the ophthalmoscope, from cataract due to high sugar feeding.

VITAMIN C IN CANNED VEGETABLES. Marked variations in vitamin C content have been found in tomatoes, spinach, peas and green beans from year to year. Standardization of vitamin C potency even under carefully controlled conditions is a difficult problem.

DISTRIBUTION OF VITAMIN B_4. A number of food materials have been assayed for vitamin

B_4 potency using chicks as the experimental animals. Dried grass, peanuts, wheat germ, pork brain and pork kidney were found to be good sources of vitamin B_4, while the grains tested were found to be relatively poor sources.

SYMPTOMS OF VITAMIN G DEFICIENCY. Vitamin G deficiency was studied in rats, chicks and turkey poults. In chicks the symptoms of vitamin G deficiency are slow growth, diarrhea and emaciation, without dermatitis. A dermatitis developed in turkey poults which was completely prevented by vitamin G (lactoflavin). Vitamin G deficiency in chicks and turkeys appeared to act more conspicuously in reducing the efficiency of food utilization than in retarding the appetite.

ANTIRACHITIC VALUE OF IRRADIATED YEAST. The daily administration during 5 winter months of 500 international vitamin D units in the form of irradiated yeast to growing infants of British and Northern European stock, prevented the development in every instance of rickets of a moderate or marked degree. The daily administration of 1000 vitamin D units in the form of irradiated yeast to one infant with marked rickets and of approximately 500 units to 4 infants with moderate or marked rickets brought about definite healing in the course of one month.

Journal of the American Dental Association

Vol. 23, November, 1936

* Bacterial toxins and vitamin C in relation to tooth structure. W. F. Swanson, A. Sigal and C. G. King.—p. 2089.

BACTERIAL TOXINS AND VITAMIN C. The level of vitamin C intake for normal tooth development is two or three times higher than the level for approximately normal body growth. Tooth structures are among the first to show histologic change when an animal is placed on a vitamin C-free diet. Guinea-pigs in the prescorbutic state are subject to marked injury to tooth structure from bacterial toxin (diphtheria) injected subcutaneously. The degree of injury is lessened when the animals receive a high vitamin C intake. Systemic effects of infections may play an important rôle in tooth development without involving an infection in the immediate tooth areas.

Journal of the American Medical Association

Vol. 107, October 3, 1936

* Distribution of cevitamic acid in tissues. Editorial.—p. 1135.

Vol. 107, October 10, 1936

* Vitamin C and tuberculosis. Editorial.—p. 1225.

Vol. 107, October 17, 1936

* Present status of dietary regimens in urinary infections. A. L. Clark.—p. 1280.

Loss of protein during fasting. Editorial.—p. 1306.

Vol. 107, October 24, 1936

* Hypochromic anemia and alkali therapy in peptic ulcer. Editorial.—p. 1391.

Vol. 107, October 31, 1936

* The incidence of trichinosis in San Francisco. J. B. McNaught and E. V. Anderson.—p. 1446.
* A review of the gastric ulcer problem. S. M. Jordon.—p. 1451.
* Observations on the etiologic relationship of achylia gastrica to pernicious anemia. W. B. Castle and T. H. Ham.—p. 1456.

Vol. 107, November 7, 1936

* Effect of fat on gastric tonus. Editorial.—p. 1562.
* Problem of nutrition. Editorial.—p. 1563.

Vol. 107, November 14, 1936

* Clinical experience with an improved crystalline insulin. S. S. Altshuler and R. Leiser.—p. 1626.

Vol. 107, November 21, 1936

* Food poisoning. Editorial.—p. 1720.

Vol. 107, November 28, 1936

* Hypoparathyroidism. R. H. Freyberg, R. L. Grant and M. A. Robb.—p. 1769.

Myasthenia gravis. Editorial.—p. 1812.

CEVITAMIC ACID IN TISSUES. Practically all tissues of the body contain some vitamin C but in general the largest amount is present in glandular tissue and the least in muscle tissue and stored fat. The adrenal, pituitary, corpus luteum and thymus contain the largest amount of the vitamin, whereas the pancreas, liver, spleen, testis, ovary, brain, thyroid, submaxillary gland and intestinal mucosa contain successively less.

VITAMIN C AND TUBERCULOSIS. Vitamin C plays an important part in determining the resistance of the animal organism to certain types of bacterial infections and toxins. A protective effect of vitamin C against tuberculosis infections in animals has repeatedly been described. Studies on humans have indicated that there is an increased requirement for vitamin C in tuberculosis and that a somewhat subnormal amount of the substance is excreted daily in the urine.

DIETARY REGIMENS IN URINARY INFECTIONS. An elaborate ketogenic diet, a simplified ketogenic diet and a low calorie ketogenic diet are given in detail. Prolonged ingestion of yeast may cause renal calculi or an excessive amount of crystalline elements in the urine. Mandelic acid has proved to be an effective urinary antiseptic and should be tried before the ketogenic diet.

HYPOCHROMIC ANEMIA AND ALKALI THERAPY IN PEPTIC ULCER. Patients given alkali therapy for peptic ulcer complicated by an iron deficiency anemia will remain anemic until alkalinization is discontinued or until large amounts of iron are administered.

TRICHINOSIS. Since there are no practical methods of inspection for trichinous meat, the consumer must assume the responsibility of preventing trichinosis by thoroughly cooking all fresh pork.

GASTRIC ULCER. Even though surgical intervention in ulcer has been made, the patient must practice care in diet, abstention from smoking and alcohol and, above all, avoidance of extreme fatigue and worry. Shunning of certain temptations of the flesh and all vexations of the spirit is an important guiding principle in gastric as well as duodenal ulcer.

PERNICIOUS ANEMIA. Normal human gastric juice does not contain, on oral administration, an "antipernicious anemia principle" effective without contact with the food (extrinsic) factor. Beef muscle and gastric juice administered without opportunity for contact are not effective in pernicious anemia.

EFFECT OF FAT ON GASTRIC TONUS. Aristotle observed that "Now the best digestion is in the bottom of the stomach, because the fat descends not there; such as eat fat meat are very sleepy, by reason that digestion is hindered." This truth has been repeatedly confirmed in more modern studies of gastrointestinal function. The experimental results of Waugh permit the conclusion that the site of initiation for the gastric inhibitory mechanism is not in the stomach but in the upper part of the small intestine.

PROBLEM OF NUTRITION. The committee on nutrition of the League of Nations has completed two of its four volumes. In the first volume it is obvious that the gaps between general knowledge on nutrition and the application of this knowledge in legislative practice are wide. The second volume contains the following recommendations: 1. Although a simplified diet may be so constituted from a few protective foods as to be satisfactory, variety in diet tends to safety. 2. The use of white flour should be decreased and partially replaced by lightly milled cereals. 3. Milk should form a conspicuous element of the diet of all ages. 4. Fresh vegetables and fruits should always be constituents of the normal mixed diet. 5. The need for extra vitamin D whenever sunshine in not abundant is especially emphasized.

DIABETES. Crystalline insulin produces a more gradual and more prolonged effect on the blood sugar than old insulin. The duration of action on nondiabetic patients is approximately 13 to 14 hours. In the treatment of diabetes mellitus, blood sugar levels are better controlled with fewer doses or with fewer total units. The number of injections and the amount of insulin is sometimes less when the crystalline variety is used.

FOOD POISONING. The contamination of food with specific pathogens is best dealt with by thorough cooking, by general measures of cleanliness, by careful avoidance of foods derived from sick or unsound animals, and by supervision of food handlers. The chief danger from botulism lies in the use of

locally grown and home canned foods. Staphylococci are able to produce a poisonous substance in cream-filled pastries in hot weather. Prompt and constant refrigeration is an important aid in preventing bacterial multiplication.

HYPOPARATHYROIDISM. To compensate most satisfactorily for the altered state of calcium and phosphorus metabolism in hypoparathyroidism, the intake of phosphorus should be low and the calcium high. This can best be accomplished by feeding a low phorphorus diet and large amounts of calcium salt, other than a phosphate. Vitamin D is of a definite value and should be given. Parathyroid extract is not necessary.

INSTITUTION MANAGEMENT

The American Restaurant Magazine

Vol. 19, October 1936

* Restaurant operating costs. Horwath and Horwath.—p. 55.
A parade of profit making economy dishes. H. Ewing.—p. 64.
* Determining basic facts about food costs by butchering tests. J. N. Horwath.—p. 70.

Vol. 19, November, 1936

* Streamlining the school feeding plant. J. Lippit.—p. 40.
Mince pie with a new taste thrill. M. B. Strause.—p. 43.
Glass washing machine introduced.—p. 74.

COST VERSUS PROFIT. The value of "Record Keeping", a standard form of profit and loss statement adopted for the restaurant industry by the National Restaurant Association, in classifying merchandise cost and other expenses cannot be overestimated in determining the success of daily business.

MEAT AND POULTRY YIELDS. Actual yields have been determined on lamb racks, short ribs of beef, short loin, fowl, hen turkeys and smoked ham giving reliable comparative data of weight per order and average cost per order as finally served to guests. All weights for each step in the yield studies, from the time the wholesale cut is weighed in by the store until each order from the cut has been served in the dining room, are recorded in detail.

COLLEGE CAFETERIA. Erection of new Martha Van Rensselaer Hall at Cornell College provided new cafeteria and kitchen for operation by institution management students. The equipment was selected for low cost of operation and ability to stand hard usage. Savings thus effected for future upkeep and maintenance have resulted in its operation on a paying basis after first defraying all overhead costs.

Buildings and Building Management

Vol. 36, October 1936

* Standard-practice orders on care of bronze.—p. 33.
* Maintenance of floors. H. E. Christianson.—p. 34.
Modern elevator service.—Part three: supervision and operating check-ups. H. C. MacGraham.—p. 40.
* Employee record cards aid in personnel control. D. L. Elliman & Co.—p. 52.

Vol. 36, November 1936

* Squeezing profits from steam. E. A. Tyler.—p. 30.
A standardized form for percentage leases. M. Wilson.—p. 34.

CARE OF BRONZE. Bronze cleaned and lacquered by men trained for work. Most bronze above third floor Fisher Building, Detroit, is maintained by oiling, some by lacquering and a little by polishing. Method and equipment are given for lemon oiling, also lacquering and detailed instructions necessary for employees to complete job with dispatch.

CARE OF FLOORS. Materials and procedure for caring for rubber tile, linoleum, and asphalt tile designed to prolong life and increase their natural beauty, are given in detail.

EMPLOYEE'S RECORD CARDS. Illustration and discussion of form cards kept for information concerning employees. Records of regulation personal data plus detailed service

record are filed, such as deportment, efficiency, faults and assets.

PROFITS FROM STEAM. Report of a complete study of heating costs and practices in a St. Paul building, giving procedure for investigation and results that secured a 15% saving in steam consumption.

Journal of Home Economics

Vol. 28, October 1936

* Meat grading. F. E. Smith.—p. 562.
* Standardization of working heights. M. Wilson.—p. 570.
Potatoes and the vitamin B complex. E. Wood.—p. 571.
Some factors influencing the vitamin C content of several varieties of western apples with a comparison of two methods. E. N. Todhunter.—p. 571.
* Availability of the calcium of spinach and kale. M. L. Finche-E. A. Garrison.—p. 572.
Studies of emulsions of the mayonnaise variety. I. S. Hall-E. E. Holstrom.—p. 572.
* Comparative study of twenty-one institutional dietaries. H. B. Thompson.—p. 573.

Vol. 28, November 1936

The W. P. A. school lunch project. E. S. Woodward.—p. 592.
* A survey of school lunch rooms. D. S. Lewis-P. S. Sprague.—p. 600.
What the hotel expects of the college-trained apprentice. T. E. Himmelmon.—p. 614.
* Recent trends in vitamin research. R. A. Dutcher.—p. 621.

COMPULSORY MEAT GRADING. In the year and a half since compulsory grading of beef, mutton and lamb was put into effect in Seattle, the quality of beef has been raised without advancing the price. Seattle was first city to make compulsory the grading system used by the Bureau of Agricultural Economics, U. S. Department of Agriculture.

WORKING HEIGHTS. Describes coöperative Washington-Oregon project on standardization of working heights for sinks, work surfaces, counters, and kitchen chairs.

AVAILABILITY OF CALCIUM. Study of calcium balance in two healthy women where spinach and kale furnished 80–87% of calcium. Kale was found to be much more available source of calcium for the human body than spinach.

INSTITUTIONAL DIETARIES. Twenty-one dietary studies for periods of one month were made in public institutions to determine nutritive values, percentage distribution of calories, and relative costs. Food selections showed fruits and vegetables displacing part of the cereals set up in earlier standards published by Rose and Gray. Adequacy was not found correlated with cost of dietary. Monotonous diets tended to be low in calcium and iron. Daily per capita costs varied from 15.9 to 41.7 cents. Applications of recommendations showed more intelligent selection of food and improved nutrition of residents when four institutions were again surveyed. Inadequate help and lack of proper equipment caused by ignorance of needs by boards of control were more responsible for low nutritive standards than lack of interest or knowledge on the part of those immediately responsible for food service in institutions.

SCHOOL LUNCH ROOMS. Commercially trained supervisors tend to work for profit rather than health. Survey shows standards for heat, light, ventilation, and appearance are low, that there is very little guidance in wise food selection and a wide range in length of lunch period with a 30 minute average most often reported for large cities. Ten constructive recommendations for improvement of existing conditions are listed.

VITAMIN RESEARCH. Discusses the trends in research on vitamins A, B, C, and D. Workers are concentrating on the isolation of vitamins; improvement and standardization of assay techniques and of vitamin unitage; reëstimation of vitamin content of foods and vitamin stability during food processing; and further elucidation of the vital physiological functions of vitamins in the living organism.

The Horwath Hotel Accountant

Vol. 16, October 1936

* Simplified system for small hotels. Editorial.—p. 2.
* The trend of business in hotels.—p. 3.

Vol. 16, November 1936

* Trend of hotel rates. E. B. Horwath.—p. 4.
* Menu-pricing for profit. P. Simon.—p. 6.

SIMPLIFIED SYSTEM FOR SMALL HOTELS. Announces the publication of a booklet giving illustrations, forms and outline for minimum bookkeeping, based on the few systematic daily records for hotels of less than 100 rooms.

TREND OF BUSINESS IN HOTELS. Food costs of over 50% of hotels for the months of May, June, and July show a 2% reduction per dollar sale against the same period in 1935. Beverage costs show 8% reduction in over 75% of hotels for same period. This condition may tend to cancel effect of rise in food prices provided restaurant sales continue above those of year past.

TREND OF HOTEL RATES. A plea for intelligently adjusted room rates. Higher room rates have been accompanied by increased occupancy and therefore greater profits. Increased travel, both business and tourist, has raised hotel occupancy.

MENU-PRICING FOR PROFIT. To secure profit, know number of seats, also their turnover capacity for breakfast, lunch and dinner, the cover cost per dollar sale before including actual cost of food; and how high food cost per dollar sale can run and clear a profit. The ratio of cover turnover in business districts is 58% for luncheon, 6% for breakfast and 36% for dinner. Less hearty luncheon dishes lend themselves to greater percentage of profit. The "elective" menu, in which the price for each entree covers all the other courses making up the meal, represents a great advance in merchandising and a real boon when it is necessary to raise prices.

Hospitals

Vol. 10, October 1936

American Hospital Association objectives for 1937. C. W. Munger.—p. 35.
The small general hospital. W. S. Rankin.—p. 48.
Ancient diet tables and hospital rules. J. N. Hatfield.—p. 62.
Hospitals and workmen's compensation. J. E. Ransom.—p. 74.
A study of laundry costs at the Paterson General Hospital. E. C. Hayhow.—p. 107.

Vol. 10, November 1936

Floor covering material for hospitals. A symposium.—p. 86.
• How we celebrate hospital day. F. M. Rice.—p. 101.

VISUAL EDUCATION. Describes effective way in which the Memorial Hospital, Owosso, Michigan, celebrated National Hospital Day by inviting visitors. Reproduces posters used to illustrate quantities of foods prepared and served by the dietary department during a year.

Hospital Management

Vol. 42, September 1936

Keeping the patient in the foreground of hospital thought. F. J. Brown.—p. 24.
• The threefold duties of the modern dietitian. J. Crooks.—p. 27.
The wheatless allergy diet. L. A. Jamison.—p. 37.
• The chef answers. W. M. Shaw.—p. 40.
Grinstead food price index.—p. 45.

Vol. 42, October 1936

Milk-free, egg-free allergy diets. L. A. Jamison.—p. 37.
Serving sandwiches. W. M. Shaw.—p. 38.
Grinstead food price index.—p. 45.

Vol. 42, November 1936

What a purchasing agent should know about china. A. G. Hiller.—p. 20.
• The dietitian as a factor in hospital care. F. MacCurdy.—p. 22.
• Carving meats for profit. W. Eliason.—p. 35.
The Thanksgiving menu. W. M. Shaw.—p. 37.
Institutional food costs still rising.—p. 43.
Grinstead food price index.—p. 43.

HOSPITAL DIETITIAN'S JOB TODAY. Administrative, scientific and educational duties include responsibility for cleanliness in handling food, attention to individual desires of the patient, intelligent and careful interpretation of the doctor's orders, education of the patient before he leaves the hospital, and re-education in the case of the faddist and the misguided individual.

FOOD PREPARATION. Food preparation questions of universal interest are answered, and tested quantity recipes given with special reference to Chinese dishes. Other recipes not frequently found are Belgian apple cobbler, French crumb topping and sauerbraten.

DEPARTMENT LEADERSHIP. Discusses the contribution of a nutrition department as it affects all other hospital departments as well as the ultimate success of the hospital itself. Dr. MacCurdy believes that membership requirements of the American Dietetic Association are not high enough. Leadership plus scientific knowledge are equally essential for a nutrition department head. Hospital needs dietary management which will create not only desirable hospital atmosphere and morale but also superior departmental morale. A wise delegation of duties provides more time in which the department head can consider broader problems of intelligent administration without loss of departmental efficiency in carrying out details.

CARVING VERSUS PROFITS. A dietitian points out ways of reducing expenditures for meat, based upon tested carving procedures and control in effect at Greenfield's, Inc., Detroit. Meat costs represent the largest item in food budgets. Discriminating selection of cuts for each dish and careful and scientific cooking must be followed by an intelligent use of carving tools with keen edges to assure reduction of scraps, increased servings per pound and utilization of each wholesale cut of meat in the most economical manner.

Hotel Management

Vol. 30, October 1936

* Speed wagon service.—p. 293.
* Meals de luxe for air service.—p. 294.
What they say about education.—p. 298.
* The menu profit maker. J. O. Dahl.—p. 333.
Profits from deep fat frying.—p. 340.

Vol. 30, November 1936

* How to get more out of your payroll dollar.—p. 399.
1000 buyer customers.—p. 404.
What the modern executive should know about load curves. C. I. Sayles.—p. 415.

QUICK SERVICE. Hotel in Kansas City has increased food sales materially by use of speed wagon service. All courses are served from 11 wagons.

AIRPLANE MEALS. Mrs. E. B. Eastburn, director of food service for Eastern Air Line, gives specifications to restaurants and hotels for attractive preparation and packing of food in card-board boxes with paper utensils. Gives menus and photographs of luncheons packed for delivery to airplanes.

MENU VARIATIONS. Prices should be studied from day to day and a large percentage of fresh foods purchased when they are in season. Feature dishes different from competitors.

PAYROLL AND EMPLOYEES. The 24 points to remember when hiring employees will prove invaluable to the dietitian on her first job.

Hotel Monthly

Vol. 44, September 1936

* The executive housekeeper of the small hotel. J. Van Ness.—p. 17.
New materials used to construct a modern coffee shop —p. 23.
* Economical ice cream production. E. H. Handy.—p. 38.
* "Waiter, I would like something different today". D. J. Korp.—p. 44.

Vol. 44, October 1936

A restaurant for men. F. Moore.—p. 15.
Enough employees to give guests service.—p. 21.
A. H. A. symposium on air conditioning.—p. 28.
* No frills or fuss about this dish, but it sells. G. Garces.—p. 50.

Vol. 44, November 1936

The national hotel exposition.—p. 39.
Courtesy pays dividends. F. L. Andrews.—p. 41.
A holiday entree that can be sold the year 'round.—p. 44.
* From a small beginning. R. Wakefield.—p. 56.
* Carving meat for profit. W. Eliason.—p. 58.

EXECUTIVE HOUSEKEEPER. Duties of small hotel housekeeper are outlined and the necessary personal qualities are discussed.

ICE CREAM. Discussion of the containers used in commercial plants. No conclusions were drawn. Gives one new recipe for frozen pineapple whip.

PROFITABLE ENTREES. How to promote less popular entrees when roast beef, lamb chop, etc. cost too much to serve at a profit.

NO FRILLS. A low cost, popular entree, spaghetti and meat balls, in a new version

with different types of service illustrated for the coffee shop, the grill and the main dining room.

SMALL BEGINNINGS. The progress of the Toll House in Whitman, Massachusetts from seven tables and one waitress in 1930, to 60 tables and 90 employees in 1936.

CARVING MEAT. An excellent review of Miss Eliason's meat cutting demonstration and talk at the National Restaurant Association meeting in Chicago, with suggestions for profitable dishes made from carving by-products such as plank steak with bread dressing, ends of pork loins in chop suey, biscuit rolls, beef and potato hash, salad fillers and sandwich spreads.

The Modern Hospital

Vol. 47, October 1936

* Dietitians invite administrators to expound views on varied topics in feeding.—p. 77.
Keeping white goods white. G. H. Johnson.—p. 90.
Plumbing the situation. W. S. Johnson.—p. 94.
Treatment of concrete floors and asphalt stairs. W. L. Wilson, Jr.—p. 98.
Recipe for a contented dietitian. M. E. Golder.—p.
* He[illegible] gravel pit. R. M. Hornsby.—p. 106.
Selective menus popular. M. F. Danforth.—p. 108.
November breakfast and supper menus. A. Colescott.—p. 112.

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Hospital bouquets. D. C. Fairburn.—p. 40.
Health education through a food clinic. S. Elkin.—p. 92.
* Happy in their new home. P. Ferraro.—p. 96.
* Special diet service is aid to staff. S. Whittingill.—p. 98.
December breakfast and supper menus. L. B. Corothers.—p. 102.

ADMINISTRATORS' VIEWS. Purchasing milk direct from dairies proves advantageous and economical in one institution. Another finds that ice cream manufactured in the hospital is less expensive and more palatable than when purchased outside. The use of acoustical materials in dietary departments is becoming more widespread and justifies the cost. Forced ventilation is advocated. Feeding of employees is simplified by having them buy their meals at a hospital cafeteria. The night personnel should have a meal duplicating that served for the regular dinner and prepared separately.

GROWING YOUR FOOD. Describes a farm and orchard with notes as to the care of food raised on hospital premises.

RENOVATION. Description of an efficient new kitchen in a hospital serving 100 patients.

NEW DIET SERVICE. Special diets served in public cafeteria to the employee, staff, student or faculty member, or office worker of the University of Iowa Hospitals, when ordered by physician. Dietitian interviews patient, food is prepared in special diet kitchen and the tray is carried by student waiters to the cafeteria where a uniform charge is made sufficient to cover overhead as well as raw food cost.

Personnel Journal

Vol. 15, October 1936

* Service, production and quality records. G. C. Pritchard.—p. 129.
* Personnel work and employee representation. C. S. Slocombe.—p. 136.

Vol. 15, November 1936

* Medical service for employees.—p. 160.
Workers as individuals. C. S. Slocombe.—p. 168.
* English management training methods. T. H. Burnham. G. A. Robinson.—p. 183.

SERVICE. Descriptions of how a public utility solved the problem of keeping a check on employees working by the hour on varied jobs not under immediate supervision. Records for checking a workman's service to the public, his production capacity, rating as a workman, and the quality of his work, are given. Lists the tangible values of such a system.

PERSONNEL WORK. Discussion of strikes and employee dissatisfactions results in the conviction that the personnel department may help to create better relationships but it cannot act as a go-between for the management and labor parties.

MEDICAL. A description of the complete medical service maintained by the Metro-

politan Life Insurance Company for its 12,000 employees at the home office, together with summaries of the various types of diseases found and their method of treatment.

ENGLISH TRAINING METHODS. The London Technical Institute reports upon the degree of success of the three types of training courses used for prospective employees with mature minds and previous industrial experience. The case system, the conference system and a combination of the two systems were found to evoke mental progressiveness, research and enthusiasm in the employees.

Restaurant Management

Vol. 39, October 1936

Antoine's wins as America's best restaurant. J. Dahl.—p. 249.

* Cafeteria principles and practices. R. T. Huntington.—p. 253.

* Profits from deep fat frying.—p. 288.

Vol. 39, November 1936

* Do's and don'ts for mechanical dish washing.—p. 367.

How six Kansas City cafeterias plan food arrangement.—p. 368.

Advertising that goes to town.—p. 370.

The menu profit maker. E. VanGilder.—p. 383.

CAFETERIA PRINCIPLES. Description of origin, history, organization, and operation of coöperative cafeterias of New York City. Reasons are given why coöperative organizations do not present competition to private business ventures.

PROFITS FROM DEEP FAT FRYING. Gives pointers on deep fat frying; selection, purchase, and storage of fat; equipment for frying, clarification of fat and correct temperatures in food preparation.

MECHANICAL DISHWASHING. Ten points on operation of dishwashing machine for maximum efficiency and satisfaction.

NEWS NOTES

The American Home Economics Association announces a Consumer Education Service, made possible through a grant from Phi Upsilon Omicron. The service will consist of occasional mimeographed releases of material of interest to teachers, homemakers, and group leaders working in the field of consumer education. Subscription is $1.00 a year and will date from September to September. Single copies of releases will be sold separately at about two cents a page. Subscriptions now received will include all material so far prepared.

Report of the Chief of the Bureau of Home Economics, 1936. This report covers all the studies made by the Bureau during the past year, with special emphasis on consumption habits of American families. Another study of significance is the dried skim-milk project. Special studies have been set up to determine quality and to provide suggestions for the use of surplus food bought for distribution to families on relief. Under studies in "Food Composition", data on the value of foods as sources of the nutritionally important minerals have been given special attention, as well as data on soybeans and soybean products, nuts, non-headed and headed cabbage and lettuce. Under "Nutrition Studies" the biological and chemical studies on the vitamin C content of orange juice and tomato juice, and the ascorbic acid content of various citrus fruits were completed. Canned tomatoes, put up both in tins and glasses, were tested for vitamin C content immediately after canning and after various periods of storage under different conditions. Other studies have included work on the nutritional significance of vanadium, experiments to determine the effect on rats of deprivation of various components of the vitamin B complex. Under "Food Utilization", studies have been continued on meat cooking, potatoes and other vegetables, bread, home canning and jelly making, etc. Under "Household Equipment" tests have been made on stoves and fuels for cooking, household refrigerators, etc.

The National Nutrition Committee of Australia, organized to inquire into the Australian dietary, has received extensive publicity in the columns of the Sydney *Sun*. A survey in the interior of Australia is being made for the committee by a member of the staff of the School of Public Health and Tropical Medicine at the University of Sydney, on the dietary problem especially as it affects children and mothers. The committee through the *Sun* has issued forms and sought the aid of housewives to obtain data on what foods are consumed, the quantity and the cost. One of a series of articles sponsored by the committee was written by Professor H. Priestley, of the Sydney University, entitled "Food Fallacies Exploded".

National Youth Administration for Rhode Island has issued a booklet on an educational program for unemployed women. Mabel O'Reilly, a former member of the American Dietetic Association and of the Rhode Island Dietetic Association, is dietitian and director of house work among the girls.

The New England Health Education Association, of which Dr. C. E. Turner is Honorary President, announces the following program for 1937 of particular interest to dietitians: At the January 12, 1937 meeting, Fannie B. Shaw, School Health Education secretary, National Tuberculosis Association, will speak on "Teaching Health in High Schools"; on February 16 the subject of "Psychological Aspects of Overweight in Children" will be presented by Adelaide R. Ross; on April 20, Mabel E. Turner will speak on "Health Education in Teacher Training Institutions".

Home Economists of the Bureau of Home Economics, Department of Agriculture, held a conference in Washington, October 26–31, together with the home management specialists from the extension service in the states. The Annual Outlook Report, entitled "The Outlook for Farm Family Living for 1937" compiled by the Bureau of Agricultural

Economics and the Bureau of Home Economics is the report of the conference published in mimeographed form.

Home Economists in Red Cross Disaster Operations. During the spring floods eleven home economists assigned to the New England and Western Pennsylvania Regional Disaster Headquarters made a very practical and effective demonstration in supervising feeding operations. Four were nutritionists from the Massachusetts State Department of Health, four were teachers of home economics, one was a manager of a school cafeteria and two were nutritionists on the staff of a public health nursing association.

The varied services of this group involved budgetary advice to social case workers, the planning of menus, preparation of food orders, supervision of the preparation and service of food at feeding centers, preparation of lunches for school children and assistance on special nutrition problems of affected families.

Favorable comments by Red Cross chapter officials, other leading citizens and the affected families were voiced regarding how well fed people were and the value of this service in health protection. It is also significant that in one instance the services of one nutritionist was estimated to have resulted in a $10,000 saving.

Peiping Union Medical College, China. Estelle Nesbitt, chief dietitian of the dietary department sends the following message to the JOURNAL: "We take pleasure in sending greetings and in reporting to you some of the far reaching results of ideals and purposes of the American Dietetic Association.

"Peiping Union Medical College, like many other organizations, is going through a period of radical change. To fit the general change in policy the dietary department no longer offers a six months course to student dietitians but offers two one-year appointments annually with minimum salary to apprentice dietitians. The training of these apprentices will include even more instruction in theory than was possible in the six months course.

"Last year a four months course in hospital dietetics in Chinese for graduate nurses was offered. Four nurses completed the course. The course will be given annually to a class of limited size. The demand for this course is much greater than our small staff can satisfy. The time equivalent of one full-time dietitian is spent in teaching in the School of Nursing. The increasing interest in the subject of nutrition on the part of Chinese nurses is quite amazing and equally gratifying. The same may be said of the Chinese medical group. The administration of the department with its complications arising from doing the work in two languages never grows monotonous."

Miss Nesbitt adds the following news item: "Helen Burkett, first assistant, has just returned from a month's holiday at Peitaiho, a seaside resort. I sail for Japan in September for my holiday. About next May, Gertrude Hodgman, dean of the School of Nurses, and I plan to fly to Echang and take a boat trip through the Yangtze gorges. In November 1937 I hope to continue my trip around the world and Miss Burkett will follow seven months later".

Royal Prince Alfred Hospital, Sydney N. S. W. Edith R. Tilton, dietitian of the hospital, sends the following letter: "I am receiving the JOURNAL regularly and enjoy it very much. I find that I read it even more carefully than I did when in close contact with other dietitians. There is a great deal of interest here which I hope will eventually make interesting reading for other dietitians. During the three months since my arrival, practically all of the kitchen equipment has been replaced with new and modern designs. The dining room of the Nurses' Home has been completely done over and tomorrow we open the new intermediate division of two hundred beds, which would compare favorably with the nicest private hospitals in America. You can imagine that my time is very full, as we are trying to establish in a few months a really modern dietary department".

Symposium on Protamine Insulin. The Fourth Medical Division of Bellevue Hospi-

tal, with Herman O. Mosenthal, M.D. as presiding officer, held this symposium on December 15, 1936 at Bellevue Hospital, New York. The following papers were presented: "Protamine Insulin: Consideration Based Upon Results of Widespread Clinical Trial", Franklin B. Peck, M.D., Lilly Research Laboratories, Indianapolis; "The Use of Protamine Insulin in Tuberculous Diabetics", Elmer S. Gais, M.D., adjunct physician, Montefiore Hospital; "The Clinical Evaluation of Protamine Insulin", Harry G. Jacobi, M.D., associate attending physician, Lenox Hill Hospital. The discussion was conducted by James Ralph Scott, M.D., chairman, New York Diabetes Association.

"Wheat Flour News" has the following interesting item: "All persons delivering popular lectures in Germany on human nutrition must possess certificates stating that such lecturers are properly qualified. It is believed that such regulation is in the interest of the general public health. Qualified lecturers, presenting facts instead of fads, will conform to the national government policies on public health, as well as on agrarian matters. The measure, it is hoped, will encourage popular education on nutritional subjects."

Alice G. Carr, director of Public Health, Near East Foundation, Athens, Greece, included in one of her recent letters the following interesting information on Greek cookery: "As to Greek cooking generally, it is done with olive oil, the foods being prepared and laid in a large container, over which a sauce made from onions browned in olive oil is poured and the whole thing baked. This dish consists of either pieces of lamb or fish and whatever vegetables are in season. Always there are tomatoes in this dish. We get them from Egypt when ours are gone. Salads are eaten plentifully, usually mixed. Onions and olive oil again play an important part here. Lemon juice is a popular addition to soups, meats and in fact all foods except sweets. Fruits are eaten by everybody who can buy them, especially in the summer when figs and grapes are in season. Oranges are used in the winter. We have many and beautiful fruits here.

"Bread is a standby of the Orient. It is not highly milled and is very nourishing. The poor often eat this with an onion as a lunch. Cheese made from goat and sheep milk is very generally eaten. The black bread of this land is delicious and satisfying.

"Altogether, people here eat much more 'natural' foods than in Western countries. The wheat and grains are not refined. Salads are made from really green vegetables.

"Beans are much used in place of meat which is expensive for the poor. Not much beef is eaten, it is always lamb and fish. Fish here are marvellous, fresh and fat. There are infinite varieties in combining and arranging foods, always with an eye to economy of fuel which is scarce, also utensils which must hold many things at a time as the fires are most often small charcoal ones, and take only one vessel."

Professor Anna Gilchrist Strong, O.B.E., Dean of Home Economics at Otago University, Dunedin, New Zealand, recently became a member of the American Dietetic Association.

Sybil H. Holmes, who spoke at the 1935 Annual Meeting of the American Dietetic Association, recently received the honor of being the first woman to be elected to the Massachusetts State Senate. Miss Holmes also was the only woman ever appointed to sit as a Master by a Judge of the Supreme Judicial Court of Massachusetts, and was Assistant Attorney General of the Commonwealth from 1931 to 1934.

Lola Lenardson, assistant dietitian at Vassar Brothers Hospital, Poughkeepsie, New York, was married in September to Richard Petersen of St. Louis and is residing in that city at 5611 Enright Avenue. Delphine S. Heston of Poughkeepsie succeeded Miss Leonardson. Miss Heston is a graduate of the University of Wisconsin and took her post-graduate work at Grasslands Hospital, Valhalla, New York.

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Laura Comstock is one of the authors of a paper "Cod Liver Oil" published in *Industrial Medicine* for July, 1936. A five year study of the value of cod liver oil for reducing industrial absenteeism caused by colds and respiratory diseases leads the authors to conclude that cod liver oil is of value in this respect and improves general health.

Women's Educational and Industrial Union, Boston. The administrative student dietitians of the Union will have blocks of time scheduled to the Dartmouth Dining Halls and Wellesley College coöperative and regular dormitory dining rooms beginning with the 1936–37 group. This will add the women's and men's college dining hall problems to their present broad scope of work.

California Dietetic Association. The twelfth annual convention was held August 27–29 at the Fairmont Hotel, San Francisco. Papers were read by Dr. W. McKim Marriott, Dean of Medicine of the University of California, on "Recent Advances in Nutrition with Special Reference to Infants and Children"; by Hyman Tucker, M.D., Agnew State Hospital, on "The High Vitamin Diet"; and by Garnet Cheney, M.D., Stanford University Hospital, on "Recent Trends in the Dietetic Treatment of Gastric and Duodenal Ulcers". Katherine Brown, president, was the honored guest at the banquet which concluded the convention, and which was presided over by Lucile Waite, past president.

Chicago Dietetic Association held its regular November meeting at Hull House. An interesting program was sponsored by Alberta Childs, of The Infant Welfare Society. The topics discussed, all by staff members of the Society, were: "Mexican Food Customs", Louise Majounier; "Negro Food Customs", Martha Janeway; "Polish Food Customs", Velma Eichorn; and "Italian Food Customs", Ruth Hummel.

There was also a display of "typical foods" served by people of the various nationalities, and the program chairman invited a Mexican and an Italian housewife as guests of the association. The guests answered many questions concerning their food habits and methods of food preparation.

The December meeting will be held at Michael Reese Hospital. Dr. Herman Smith, superintendent of the hospital, will speak on "Modern Trends in Hospital Administration."

The Detroit Dietetic Association, under the chairmanship of Alice H. Smith, sought to widen its contribution to the community of Detroit in 1935–36 by instituting a Library Committee. During that year its efforts were entirely financial. Ruth Smithyman of the Henry Ford Hospital directed a most successful benefit bridge through which $150 were obtained for the purchase of nutrition literature for the Detroit Public Library. Lack of money and interest in reliable nutrition information on the part of the public at large have kept the Library Commission from purchasing many books on the subject. The 1936–37 Library Committee of the Detroit Dietetic Association, Ruth Smithyman, B. Alene Theisner, Gertrude Henry and Helen Hunscher, chairman, have made purchases according to the wishes of the association and seeming needs of the public. A recommended list of books, composed of those in the library which are of sound scientific origin according to the judgment of the committee, and those purchased by the association, will be distributed to all members of the association, as well as the Home Economics Association and others interested in the source materials used by the local group. In addition to calling the attention of professional groups to newly purchased literature, in addition to that already in the library, publicity through newspapers and women's clubs has been instituted. An exhibit of authentic books and pamphlets on food purchasing, economy meal planning and preparation, as well as practical and scientific nutrition, has been planned by the library in coöperation with this committee. The Library Commission has asked the dietitians' committee to give advice concerning future selection and purchase of literature on foods and nutrition by the library itself. The

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association is making an earnest effort in this work to make a contribution to the health and welfare of the community.

The September meeting of the association was a dinner meeting held at the Women's City Club. Officers for the year are as follows: president, Mrs. Alice Smith; vice-president, Mrs. Marie Diton; Secretary, Mrs. Alene Theisner; and treasurer, Margaret King.

The October meeting was at the Ford Hospital Nurses' Home; reports of the Boston convention were read.

Greenfields Restaurant was the place of the November meeting and a most interesting talk was given on equipment, personnel, etc.

Iowa Dietetic Association. The fall meeting was held at the University Hospital, Iowa City, on November 5. The first part of the morning session was occupied with reports of the national meetings: the American Dietetic Association by Dorothy Moore, Children's Hospital, Iowa City; the American Hospital Association by Dr. Kate Daum, director of nutrition at the University Hospitals. Dr. Daum was chairman of the section on dietetics at the Hospital Association meeting.

Following the reports, Mary Jane Murray, student dietitian at the University Hospitals, gave a resumé of the analysis of vitamin content of typical two-weeks' dietaries submitted by 22 hospitals. She found that the dietaries were adequate in vitamins A and C, but very low in vitamin B. A business meeting concluded the morning program.

Dr. Daum entertained the association at a delightful luncheon in her home.

In the afternoon Dr. Adelaide Barer, research associate, Department of Internal Medicine, University Hospital, reviewed some of the work she has done on iron metabolism, particularly in women. Protamine insulin was discussed by Dr. R. B. Gibson, associate professor of biochemistry at the University. Professor L. G. Allbaugh gave the food outlook for the coming few months as predicted by the Department of Agricultural Economics of Iowa State College, Ames.

Caroline Kendall, formerly therapeutic dietitian at the University Hospital, Iowa City, was married on October 6 to John Miller. They are living in Lansing, Michigan.

Maryland Dietetic Association. Florence Waechter Johnson, vice-president and publicity chairman, represented Maryland at the 19th Annual Meeting of the National Association held in Boston. The Maryland delegation registered at the Statler Hotel was as follows: Eloise Rodney Trescher, Food Clinic, Johns Hopkins Hospital; Kathleen Lewis, Johns Hopkins Hospital; Ernestine Becker, Johns Hopkins University and Hospital; Margaret C. Thomas, Hood College, Frederick, Md.; Alice Jane, Catonsville, Md.; and Florence W. Johnson, Dundalk, Md.

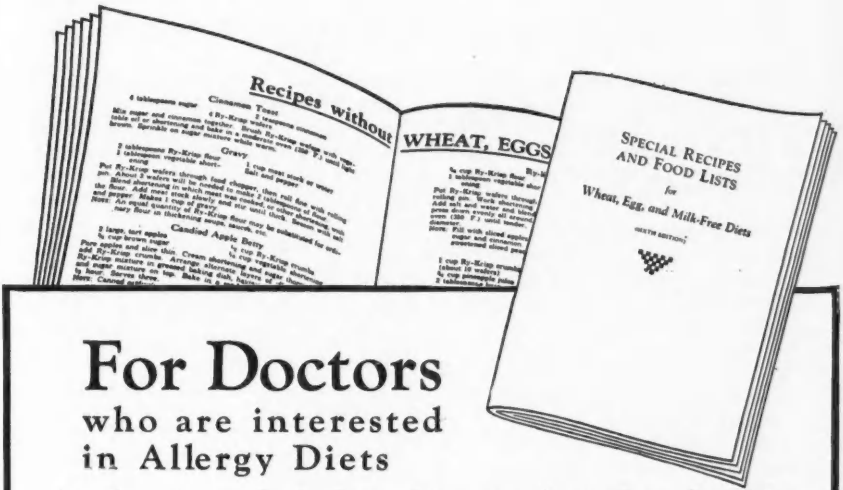
The group was proud to have one of the members, Kathleen Lewis, Johns Hopkins Hospital, read the resolutions of the American Dietetic Association, at the publicity dinner held the last night of the convention.

The Johns Hopkins Dietitians held a reunion dinner at the Viking Restaurant the first night of the convention. Ten staff dietetians and students related incidents connected with their work. Phyllis Rowe sent greetings as she was unable to attend the convention this year.

Mrs. Ethel C. Gardner, Emergency Charity Association of Baltimore, has accepted the appointment as chairman of the Professional Education Committee.

Dr. Louise Stanley, chief of the Department of Home Economics, Bureau of Agriculture, who is well versed in all interests of food and administration, was the guest speaker of the evening at the October meeting of the association held at the College Club in Baltimore.

The association held a joint dinner meeting with the dietetic association of the District of Columbia at Olney Inn, Olney, Maryland, November 9. Colonel Harry C. Jones, commissioner of employment for the State of Maryland, was the guest speaker; his subject, "The Merit System of Public Employment as it Relates to Institutional Attaches". Marguerette Betts, Lutherville, Maryland,



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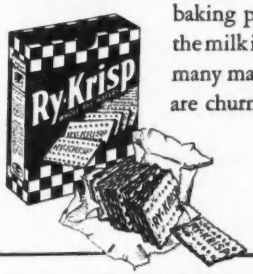

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president of the association, presided at the meeting. Eva Marks, Gallinger Hospital, Washington, D. C. and Florence Waechter Johnson of Dundalk, Maryland, gave reports of the Annual Meeting held in Boston.

The Massachusetts Dietetic Association. While the Annual Meeting in Boston was occupying the attention of most of the members of the association, numerous changes were taking place among the membership.

Beatrice Astor entered Simmons College for a year's study on a scholarship in the School of Social Work.

Kathryn Weitzel has left the Peter Bent Brigham Hospital to accept a position at Cornell Medical Center, New York City.

Margaret Wilder, formerly of the Massachusetts Memorial Hospital, is now restaurant manager for Meyer's Department Store in Greensboro, North Carolina.

Eleanor Wedberg resigned her position at McLean Hospital to become head dietitian at the New England Hospital for Women and Children. She has as her assistant, Elizabeth Woodwell who completed her student dietetic course at the Massachusetts General Hospital in September. Helene Henley, formerly of the Lawrence General Hospital, is the new dietitian at McLean Hospital.

Majorie Shea, Beth Israel Hospital, has accepted a position at the Massachusetts Memorial Hospital.

Helena Brooks has left LaSalle Junior College to become assistant to Miss Colborn at Yale University.

Virginia Amidon sailed for England on December 16 to spend four months at St. Bartholomew's Hospital, London, with Marjorie Abraham.

Edith Bandeen has accepted a position as assistant administrative dietitian and manager of the pay cafeteria at the Massachusetts General Hospital. Many of the students completing the course for student dietitians in September have gone to new positions. Frances Griswold is manager of the Y. W. C. A. restaurant in Portland, Maine; Helen McKechnie is assistant to Eileen Tolbert at the Fitchburg Hospital; Mildred Frederick is doing relief work at the Lawrence Memorial and Associated Hospitals, New London, Connecticut; Harriet Wilcox and Mildred Cook have been retained on the staff at the Massachusetts General; Grace Olson is with the Junket Co. in Allentown, Pennsylvania; Lillian Anderson is at the Henry Heywood Hospital, Gardner, Massachusetts; Barbara Keedy is at the Beth Israel Hospital; Miriam Rudy is at the Brooklyn Hospital, Brooklyn, New York; Ethel Chapman is assistant dietitian at the Boston Lying In Hospital.

Ruth Buckman, who completed her student dietetic course at the Beth Israel Hospital, is now at the Free Hospital for Women, Boston.

Ella Delaney has gone from the Winchester Hospital to the Pennsylvania Hospital, Philadelphia.

Betty Holmes resigned her position at the Peter Bent Brigham Hospital to accept a position at the Children's Hospital, Boston.

The souvenir restaurant booklet "Take Before Eating" given to the American Dietetic Association members at their Anual Meeting in Boston, with the compliments of the Massachusetts Dietetic Association and prepared by the administrative student dietitians of the Women's Educational and Industrial Union, has resulted in unexpected requests from other organizations. It has been copyrighted by the Union and will be amplified and edited each year by the incoming group of administrative student dietitians.

Nebraska Dietetic Association. The third annual meeting was held in Omaha on November 7, 1936. Displays were made of new books, tray favors and material brought from the American Dietetic Association convention. Vesta Davis of St. Joseph's Hospital, Omaha, presided at the opening luncheon and introduced Mr. W. M. Jeffers, executive vice-president of the Union Pacific Railroad. Mr. Jeffers is among the first of such executives to recognize the contribution that women can make to the railroad. He consults them on color schemes, modern comforts and service, employs graduate

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nurses as stewardesses and has made Mrs. Grace V. Merrill, a dietitian, supervisor of dining car service.

The afternoon program consisted of a talk and research report by Dr. Sergius Morgulis of the University of Nebraska School of Medicine on "Muscle Dystrophy". Angeline Phillips of the University Hospital discussed the "Work of the American Dietetic Association" and Dr. Herbert F. Gerald of the Creighton University School of Medicine discussed "Chinese Medicine".

At the business meeting the following officers were elected: president, Leta Linch, Lincoln General Hospital, Lincoln; vice-president, Lydia Beck, Methodist Hospital, Omaha; secretary, Josephine Wernimont, St. Elizabeth's Hospital, Lincoln; treasurer, Myrtle Donahoo, Lincoln General Hospital, Lincoln; and American Dietetic Association delegate, Angeline Phillips, University Hospital, Omaha.

Committee heads were appointed by the president as follows: Membership, Margaret Stuart, Edmundson Hospital, Council Bluffs, Iowa; Constitution, Leta Linch; Publicity, Marian Bartlett, University Hospital, Omaha; and Historian, Elvera Anderson, Immanuel Hospital, Omaha.

A dinner was held at the Aquila Court Tea Room. Reports of the American Dietetic Association Annual Meeting were given by Marian Bartlett and Margaret Stuart. Mary Alice Booth gave a report of the National Restaurant Association convention. Representatives of the Nebraska State Nurses Association and the Nebraska Home Economics Association were guests.

New Jersey Dietetic Association. The fourth annual meeting of the association was held on November 19, 1936, at the New Jersey College for Women, New Brunswick. Agora Hall was used for the meeting and an enthusiastic group attended to enjoy the following program. At the annual business meeting, Asta Low Packard, president, presided. Reports were made on "American Dietetic Association Convention Highlights" by Estelle Banta; "Affiliation Dinner, Boston", by Alberta Dent, official New Jersey delegate; and section activities as follows: Administration, Sophia Morris, chairman; Community Education, Margaret McCoy, chairman; and Professional Education, Elizabeth Rupert, chairman. The following papers were presented at the morning session: "Getting Acquainted with Hawaiian Foods", Harriet Stone, supervisor of nutrition, public schools, Newark; "Recent Progress in Nutrition", Grace MacLeod, professor of nutrition, Teachers College, Columbia University; "Greetings from the American Dietetic Association", Lenna Cooper, Montefiore Hospital, New York, and president-elect, American Dietetic Association. At the afternoon session, Margaret T. Corwin, dean, New Jersey College for Women, and Helen W. Hazen, head of the Home Economics Department of the college, spoke at the luncheon and the following papers were presented: "The Proposed Curriculum for Schools of Nursing", Isabel Stewart, professor of nursing education, Teachers College, Columbia University; and "Food Standards in the Commercial Field", Alice Easton, manager, Colonade Restaurant, Newark, N. J.

The following officers were elected: Asta Low Packard, consultant dietitian, Somerville, N. J., president; Lillian E. Park, Essex County Hospital, Cedar Grove, N. J.; Isabelle Stewart, Essex Mountain Sanitorium, Verona, N. J.; and Mary Murphy, Seton Hall College, South Orange, N. J.

Oregon State Dietetic Association met at Oregon State College in Corvallis for the November meeting. Professor E. H. Wiegand spoke on "Packs and Grades of Canned Goods". Jessamine Williams, Georgia Bibee, Melissa Hunter and Dr. Margaret Finke of the home economics faculty were hostesses at the dinner served in the tea room of the Memorial Union Building.

Several new members have joined the association this year. Dr. Margaret Finke is in the Department of Nutrition, Oregon State College. Louise Bartels of Fort Collins, Colorado, is now on the staff of the State Hospital for the Insane in Salem. Helen Prusak is dietitian at St. Elizabeth's

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Hospital in Baker. Wanda Bahl formerly at Polk County Hospital, Des Moines, Iowa, is at Emanuel Hospital in Portland. Gertrude Thornber who finished the affiliated course in Portland has joined the staff of the newly organized Sacred Heart Hospital in Eugene. Alethe West of Eugene General Hospital is also a new member.

Mrs. Franz Drinker, the former Dorothy Smith, has come to Portland to reside since her marriage last summer. She was formerly on the staff of the George F. Baker Clinic in Boston and at the University of Chicago, Department of Medicine.

Nellie Webb who received her M.S. degree from Oregon State College last June has replaced Dorothy J. Keane at Doernbecher Memorial Hospital for Children. Mrs. Keane represented this association at the American Dietetic Association Annual Meeting in Boston. She is spending the winter in Baltimore, Maryland.

Ruth Johnson of Good Samaritan Hospital was recently married to Albert R. Duree.

Officers for this year are: president, Edna Carl; vice-president, Lucy Reynolds; secretary-treasurer, Nellie Webb.

Dietitians Association of Philadelphia. Besse D. Howard, director of the Pennsylvania Branch of the League of Nations Association, was the guest speaker at the November monthly meeting, held at the Board of Education Auditorium on November 10. Her interesting and educational talk was entitled "Echoes of the League of Nations", and she answered many questions put to her by the audience. Members of the Home Economics Association were guests at this meeting, and, as usual, it was preceded by a dinner.

The Community Education Section presented a novel program on "Racial Dietary Problems" at the November group meeting, held at Mt. Sinai Hospital and planned by a special committee on national and racial diets. Anna DePlanter Bowes, director of nutrition education of the Philadelphia Child Health Society, was chairman of the evening. Julia E. Amerise, chief dietitian of the Woman's Hospital and Neva Betz, nutritionist of the Babies Hospital, discussed the food habits of Italian people in this country; Florence G. Fralin, former home economist of the Jewish Welfare Society, explained the various Jewish food customs and ceremonials; and Madeleine Tillman, nutritionist of the Philadelphia Inter-State Dairy Council, pointed out the good and bad phases of the Negro dietary. There were exhibits of typical foods used by each group. Evelyn Hersey, executive secretary of the International Institute, prefaced the discussions with an enlightening interpretation of the attitudes of the foreign-born and their families. Ann Meers, dietitian of the Philadelphia Italian Hospital, assisted with a large exhibit of Italian foods.

The annual Christmas party, which was planned and well executed by the Hospitality Committee, was held at the Sarah Drexel Van Renssalaer Dormitory. The price of admission was one gift for a child, and these gifts were later presented to the Salvation Army. Real Christmas spirit prevailed, and even a Santa Claus was present to make the occasion a festive one.

Margaret Richert has resigned from the Philadelphia General Hospital to take up her new duties as chief dietitian at the Loomis Sanatarium, Loomis, New York. Her place was filled by Alice Knudson. Mary Ann Carver is the new metabolic dietitian at the same institution.

The Rhode Island Dietetic Association met on November 12, 1936 for the first meeting of the year, at the Providence Plantations Club. Dr. Blood of Simmons was the guest speaker, addressing the group on the subject of "Nutrition in 1936".

Rochester Dietetic Association held the monthly meeting on October 22 at the Genesee Hospital with Gwendolyn Craver and her assistants as hostesses. Fifty members were present.

Grace Carden, Strong Memorial Hospital, gave an interesting report of the Annual Meeting held in Boston, October 11–17, which was well attended by Rochester members.

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Hazel Gabbaid, chief of nursery schools in Rochester, presented a talk, with slides, on the Averill Avenue nursery school.

Delightful Halloween refreshments were served by the hostesses.

The association held a "dessert" meeting on November 19 at the Eastman Dormitory of Women's College with Etta Handy as hostess. Forty members were present.

Grace Reid of Strong Memorial Hospital, director of Nursing Education, gave an illustrated talk on her recent travel around the world. Miss Reid's talk was particularly interesting because she had at one time lived in Tokyo, Japan.

The remainder of the evening was given over to a tour through the dormitory kitchens to which have recently been added several pieces of specially designed equipment.

Texas State Dietetic Association is publishing a bulletin every two months. The first issue of the bulletin which came out in November was enthusiastically received.

The South Texas Dietetic Association held its first meeting of the year at Memorial Hospital, Houston, September 25. The following officers were elected: president, Frances Low, Methodist Hospital, Houston; vice-president, Mamie Ruth Harris, Hermann Hospital, Houston; secretary-Treasurer, Catherine Kelker, St. Joseph's Infirmary, Houston.

The second meeting of this group was held at Methodist Hospital, October 25. At this time a parlimentary drill was conducted. On November 20, the group met at Methodist Hospital, Houston, to discuss "Routine Hospital Diets".

Mary E. Smith, Memorial Hospital, Houston, entertained the members of the South Texas Dietetic Association with a Christmas party on December 18. The group thoroughly enjoyed this holiday affair in Miss Smith's charming apartment.

The Dallas Dietetic Association held its first meeting of the year at the Stoneleigh Courts Hotel, Dallas, October 19, with 22 members present.

Mary E. Smith and Blake Bryson gave a radio broadcast from Memorial Hospital, Houston, on October 28, as part of the educational program of that hospital.

Frances Ross Lawler, Baylor University Hospital, Dallas, had a most interesting article published in the September issue of Modern Hospital titled "A Yankee Invades a Texas Kitchen".

Ruby Coury, formerly dietitian at the Residence Club, San Francisco, is now an assistant dietitian at Memorial Hospital, Houston.

Emma Chapman has recently gone to the Northwest Texas Hospital, Amarillo, as assistant dietitian.

Lorraine Warnken, formerly of Memorial Hospital, Houston, has accepted a position at Scottish Rite Hospital, Dallas.

Marie Saunders, formerly of Parkland Hospital, Dallas, is now dietitian at San Marcos Teacher's College. She was succeeded by Mrs. Elizabeth Wilson Atkerson from the staff at Baylor University Hospital, Dallas.

Grace Smith of Station Hospital, Fort Sam Houston, has been transferred to Panama Canal.

Standard Brands Incorporated, Department of Applied Research, New York, have prepared an interesting brochure entitled "What Do You Know About Bread?"

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*Tests made by Samuel P. Sadtler & Son, Inc., Analytical Chemists, Philadelphia, Pa.

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WHO'S WHO IN THIS ISSUE

Elliott P. Joslin, M.D., clinical professor of medicine, Harvard Medical School, is a world-wide authority on diabetes mellitus and author of many papers on this and related subjects, including several editions of *The Treatment of Diabetes Mellitus* and *A Diabetic Manual.* The George F. Baker Clinic of the New England Deaconess Hospital, of which Dr. Joslin is director, is the Mecca for all those who seek guidance in the treatment of diabetes. His manual for the patient, the first publication endeavoring to simplify the physical and dietary care of the diabetic, has continued to lead all others in this field. Among his professional affiliations, Dr. Joslin is a member of the American Philosophical Society and a Fellow of the American Academy of Arts and Sciences.

John W. M. Bunker, Ph.D., is professor of biochemistry and physiology and director of Research Laboratories of Biology, Massachusetts Institute of Technology. He is a Fellow of the American Academy of Arts and Sciences and the American Public Health Association (of which he is a member of the Committee on Vitamin D Milk Bioassay). Dr. Bunker is also a member of the Advisory Committee on National Formulary and U. S. Pharmacopeia, and consultant, Council on Pharmacy and Chemistry, American Medical Association.

C. A. Lilly, M.D., is research Fellow in the Department of Internal Medicine, Medical School, University of Michigan. C. B. Peirce, M.D., is associate professor in the Department of Roentgenology and R. L. Grant, Ph.D., is assistant in research in the same medical school.

Clair E. Turner, Dr. P.H. (Massachusetts Institute of Technology), is professor of biology and public health at the Institute, and director of the Malden Studies in Health Education and Growth. Dr. Turner is a Fellow of the American Public Health Association, a member of the American Child Health Association, and the author of textbooks on health education.